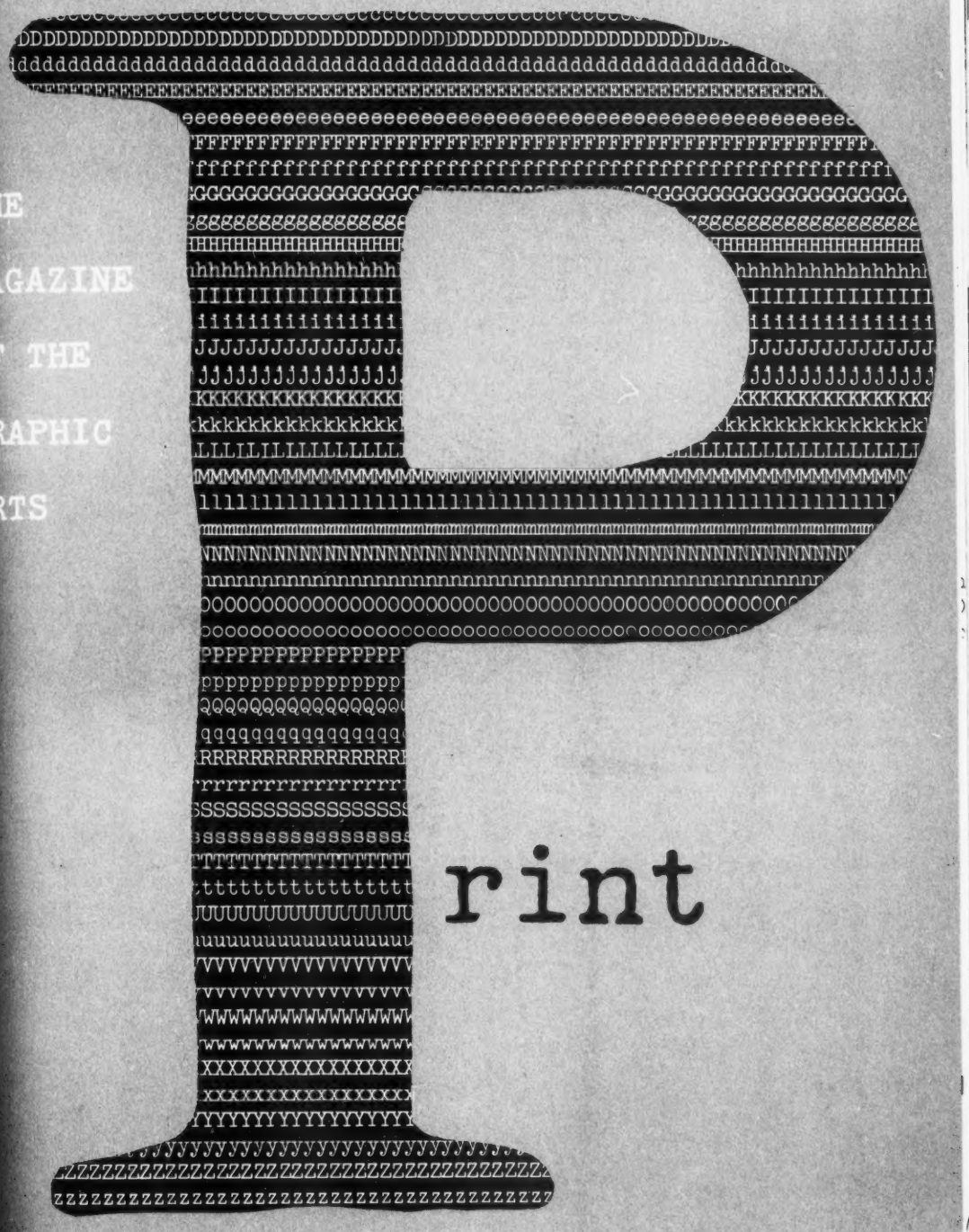
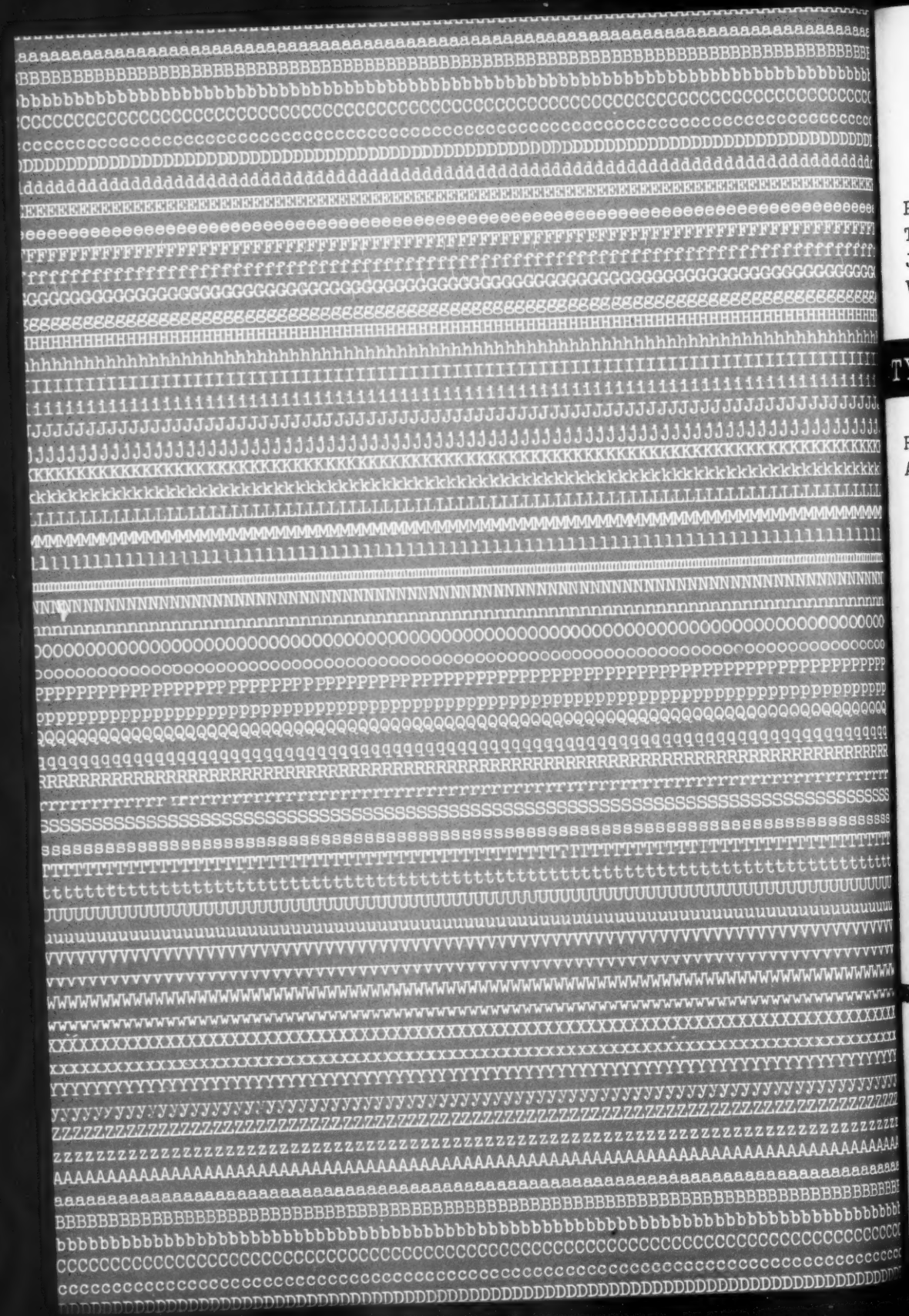


VOLUME 7, NUMBER 3, TYPEWRITER TYPE ISSUE



P R I N T
The Magazine of the Graphic Arts
June, 1952
Volume Seven, Number Three

TYPEWRITER TYPE ISSUE

Research and copy by Lawrence A. Audrain
Art Director - George A. Shealy

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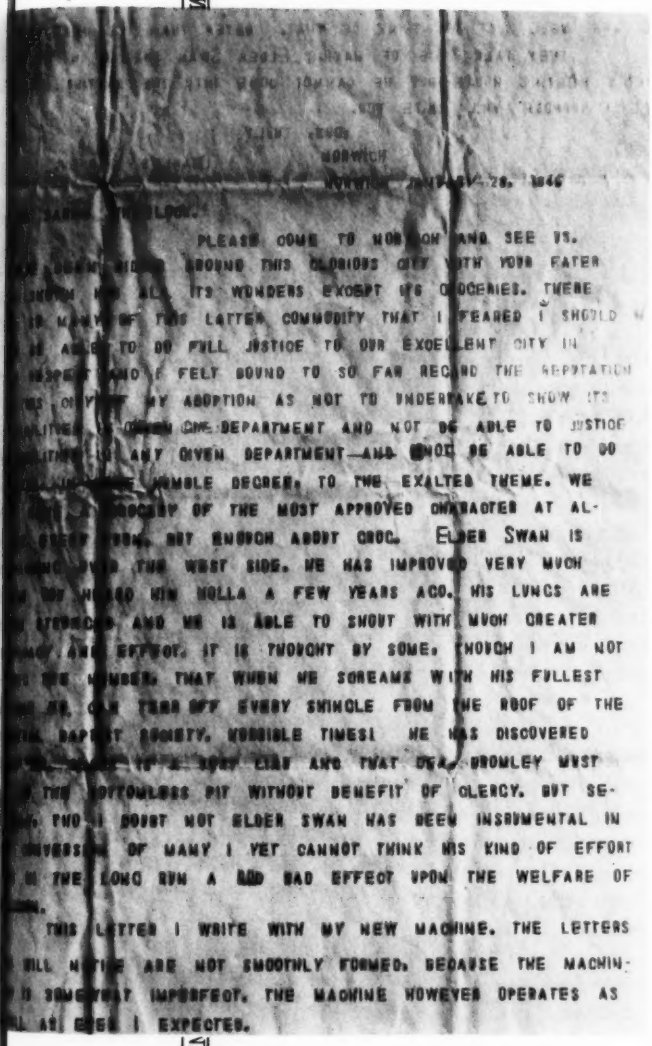
HISTORICAL BACKGROUND

"An artificial machine or method for the impressing or transcribing of letters, singly or progressively, one after another as in writing, whereby all writings whatsoever may be engrossed on paper or parchment so neat and exact as not to be distinguished from print; that the said machine or method may be of great use in settlements and publick records, the impression being deeper and more lasting than any other writing, and not to be erased or counterfeited without manifest discovery."

So read the first patent granted for a typewriter. Henry Mill, an English engineer, in June 1714 applied for and secured from Britain's Queen Anne, this "letters patent," based on the above description. No record of Mill's machine exists today, but his patent wording still stands up as a description of today's typewriter.

The first American patent, dated July 23, 1829 (No. 259), was taken out by William Austin Burt of Detroit, for a machine then called a TYPOGRAPHER. When the Washington Patent Office was destroyed by fire in 1836, Burt's model was lost.

In 1843, Charles Thurber of Worcester, Massachusetts, was granted a patent, and an illustration of a letter written on this machine is shown on page 3. Thurber's machine, while it was the first practical application of the longitudinal motion of the platen, the principle of all modern machines, never got into production. That fell to Christopher Latham Sholes of Milwaukee. Assisted by Carlos Glidden and Samuel W. Soule, Sholes produced a machine on which he secured a patent in June 1868. Sholes and his partners were unable to get into production until James Densmore, a promoter-engineer, arranged for E. Remington & Sons, the gun makers at Ilion, New York, to make their machine. A manufacturing contract between Remington and



PLEASE COME TO NORWICH AND SEE US.
AROUND THIS GLORIOUS CITY WITH YOUR FATHER
ALL ITS WONDERS EXCEPT ITS GROCERIES. THERE
OF THIS LATTER COMMODITY THAT I FEARED I SHOULD
TO DO FULL JUSTICE TO OUR EXCELLENT CITY IN
AND I FELT BOUND TO SO FAR RECARD THE REPUTATION
BY ADOPTION AS NOT TO UNDERTAKE TO SHOW ITS
ONE DEPARTMENT AND NOT BE ABLE TO JUSTICE
ANY GIVEN DEPARTMENT—AND NOT BE ABLE TO DO
WHOLE DEGREE, TO THE EXALTED THEME. WE
GROCERY OF THE MOST APPROVED CHARACTER AT AL-
BUT ENOUGH ABOUT GROC. ELDER SWAN IS
THE WEST SIDE. HE HAS IMPROVED VERY MUCH
HIS HOLLA A FEW YEARS AGO. HIS LUNGS ARE
AND HE IS ABLE TO SHOUT WITH MUCH GREATER
EFFECT. IT IS THOUGHT BY SOME, THOUGH I AM NOT
THAT WHEN HE SCREAMS WITH HIS FULLEST
CAN TEAR OFF EVERY SHINGLE FROM THE ROOF OF THE
BAPTIST SOCIETY. POSSIBLE TIMES! HE HAS DISCOVERED
AND THAT DEAR BROWLEY MUST
BOTTOMLESS PIT WITHOUT BENEFIT OF CLERGY. BUT SE-
THO I DOUBT NOT ELDER SWAN HAS BEEN INSTRUMENTAL IN
OF MANY I YET CANNOT THINK HIS KIND OF EFFORT
IN THE LONG RUN A BAD EFFECT UPON THE WELFARE OF

THIS LETTER I WRITE WITH MY NEW MACHINE. THE LETTERS
WILL NOTICE ARE NOT SMOOTHLY FORMED. BECAUSE THE MACHIN-
IS SOMEWHAT IMPERFECT. THE MACHINE HOWEVER OPERATES AS
WELL AS EVER I EXPECTED.

THURBER TYPEWRITER
AND A FIRST LETTER 1846

One of the earliest known examples of a typewritten letter. Written by the inventor, Charles Thurber of Worcester, Massachusetts, and Norwich, Connecticut,

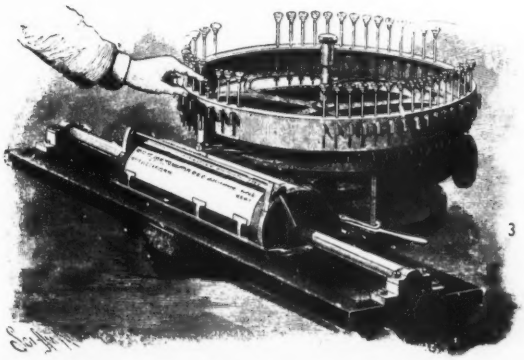
The original is now in the collection of the Martin County Historical Society, Fairmont, Minnesota.

In it, Thurber says: "This letter I write with my new machine. The letters you will notice are not smoothly formed because the machinery is somewhat imperfect. The machine however operates as well as ever I expected."

The original model of the machine is still in existence at Worcester, Massachusetts, and The Smithsonian Institute, Washington, has a copy model.

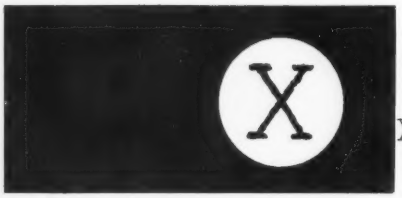
The type wheel principle of Thurber's machine is similar to that used on present toy typewriter models.

The machine was never manufactured or sold.



THE FIRST TYPIST

The daughter of inventor Christopher Latham Sholes at the prototype of the first commercial typewriter 1872.



XXXXXXXXXXXXXXXX

Sholes-Densmore was signed March 1, 1873. Sales of the machine were handled separately. By August 1874, Remington was well into production on the No. 1 machine, and by the end of the first six months four hundred had been sold. One of the first purchasers was Mark Twain (see illustration of letter). Sholes sold his royalty rights to Densmore for $12,000.00. Densmore ultimately received more than $1,500,000.00 before his rights expired.

By 1877, three thousand typewriters had been marketed, but the machine was still sufficient of a curiosity in 1876 so that, at the Philadelphia Centennial Exposition, people lined up and paid 25 cents for a small square slip of paper typed with the words:

"A MACHINE TO SUPERSEDE THE PEN"

In 1878, Remington produced the first machine with upper and lower case letters, and by 1882, Wyckoff, Seamans & Benedict took over the complete selling agency of the machine for the entire world. Prior to this, Western Union held control and rights to the machine but let them drop.

By 1886, over 35,000 machines had been marketed, and the typewriter was on its way to becoming the indispensable business tool we know today.

From the time of the Remington No. 1 introduction on the market up to 1886, a period of twelve years, over 250 patents for complete typewriting machines were issued by Washington. Besides these, thousands of improvement patents were also issued.

By the early 1880s, Wyckoff, Seamans & Benedict would already accept a trade-in against a new machine, and advertised

In most of the early examples of typewritten letters, the senders rarely signed them, usually just typed in their name.

XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX

BJUYT KIOM M LKJHGFOSA:QWERTYUIOP:.8O8KC2G⊖W R-

HARTFORD, DEC. 9,

DEAR BROTHER:
I AM TRYING T TO GET THE HANG OF THIS NEW F
FANGLED WRITING MACHINE, BUT AM NOT MAKING
A SHINING SUCCESS OF IT. HOWEVER THIS IS THE
FIRST ATTEMPT I EVER HAVE MADE, & YET I PER-
CEIVETHAT I SHALL SOON & EASILY ACQUIRE A FINE
FACILITY IN ITS USE. I SAW THE THING IN BOS-
TON THE OTHER DAY & WAS GREATLY TAKEN WIHTH
IT. SUSIE HAS STRUCK THE KEYS ONCE OR TWICE,
&NO DOUBT HAS PRINTED SOME LETTERS WHICH DO
NOT BELONG WHERE SHE PUT THEM.
THE HAVING BEEN A COMPOSITOR IS LIKELY TO BE
A GREAT HELP TO ME,SINCE O NE CHIEFLY NEEDS
SWIFTNESS IN BANGING THE KEYS.THE MACHINE COSTS
125 DOLLARS.THE MACHINE HAS SEVERAL VIRTUES
I BELIEVE IT WILL PRINT FASTER THAN I CAN WRITE.
ONE MAY LEAN BACK IN HIS CHAIR & WORK IT. IT
PILES AN AWFUL STACK OF WORDS ON ONE PAGE.
IT DONT MUSS THINGS OR SCATTER INK BLOTS AROUND.
OF COURSE IT SAVES PAPER.
SUSIE IS GONE,
NOW, & I FANCY I SHALL MAKE BETTER PROGRESS.
WORKING THIS TYPEWRITER REMINDS ME OF OLD
ROBERT BUCHANAN,WHO, YOU REMEMBER, USED TO
SET UP ARTICLES AT THE CASE WITHOUT PREVIOUS-
LY PUTTING THEM IN THE FORM OF MANUSCRIPT.I
WAS LOST IN ADMIRATION OF SUCH MARVELOUS
INTELLECTUAL CAPACITY.

LOVE TO MOLLIE.
YOUR BROTHER,
SAM.

KOSMOPOLIT

FISHER

SMITH

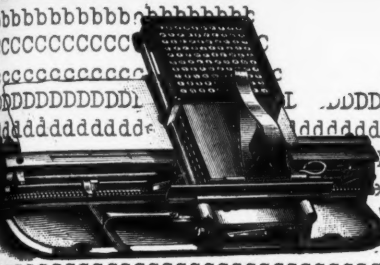
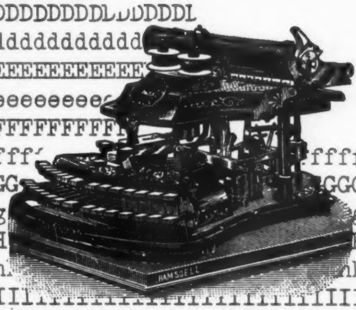
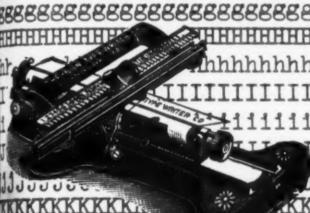
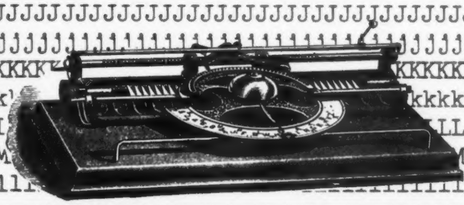
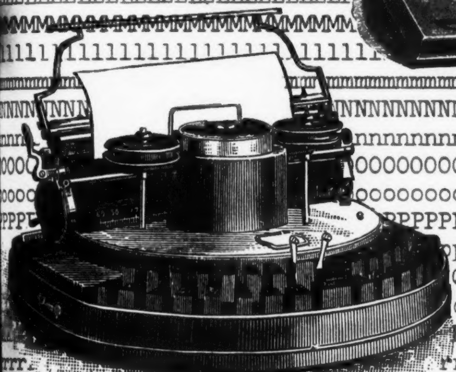
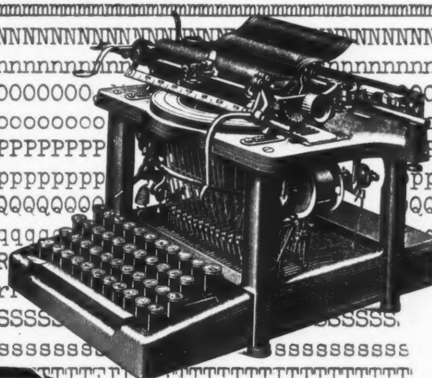
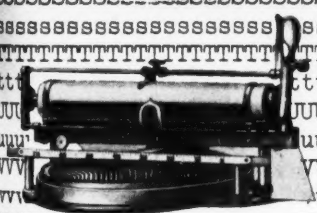
POCKET TYPEWRITER

REMINGTON NO. 1

CROWN

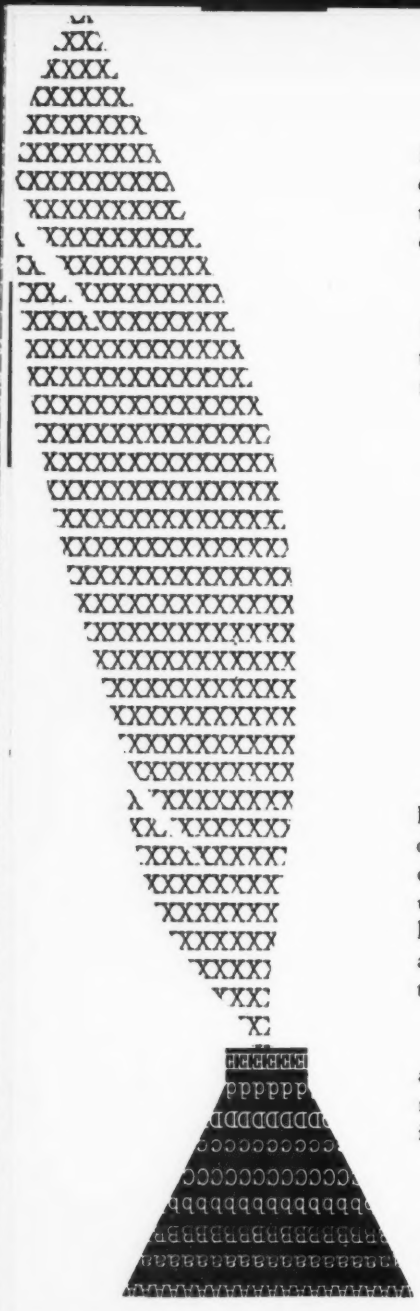
CALIGRAPH

OLIVER

CENTURY
SUN
HAMMOND
YOST

CRANDALL
WORLD
REMINGTON
YOST



in their "Typewriter Magazine" (10,000 circulation) that you could buy a second-hand machine for $30.00 or a new Remington for $125.00. Wooden cabinets, reminiscent of the old roll top desk, were supplied separately and cost from $35.00 to $75.00.

At the first National Business Show, held in New York in 1904, eleven typewriter companies had booths demonstrating their machines. Not one of those companies, as then constituted, is still in existence today. They were:

Hammond
Columbia
Fay-Sholes
Franklin
Wellington
Gray National Telautograph
Postal Typewriter Co.
Pittsburgh Writing Machine
Stearns
Sterlingworth Co. (Shippers Typewriter)
Electric Typewriter (Blickensderfer)

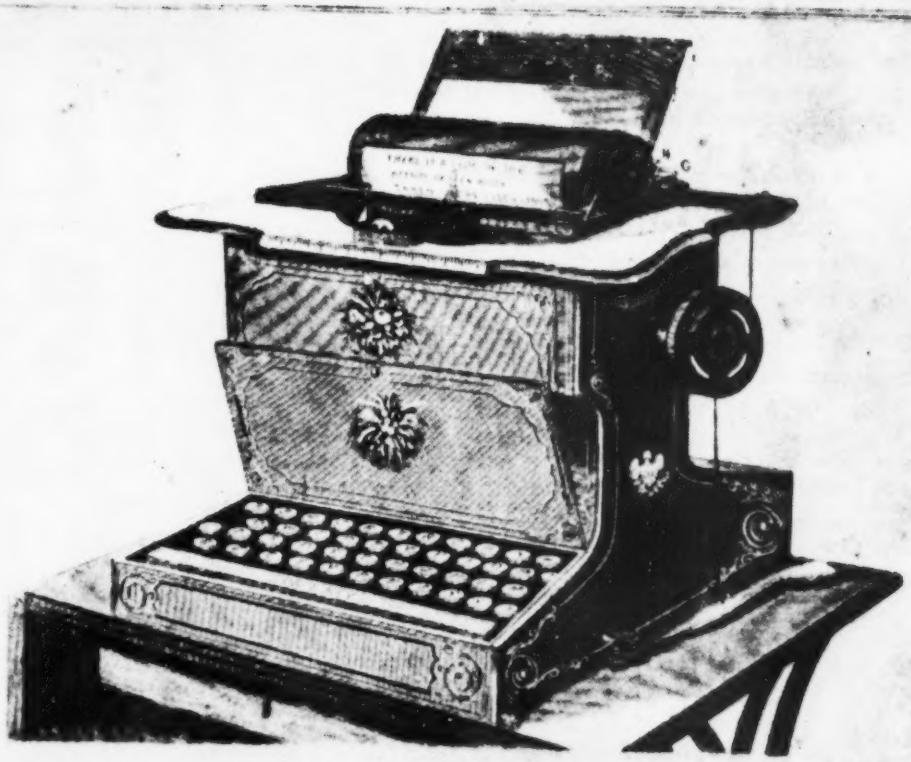
By the early 1900s, a Stamford, Connecticut, company, Blickensderfer, was advertising an electric typewriter. This machine had graduated extra striking power for making up to 15 carbon copies. By 1914, James Smathers of Kansas City, was under way with a power operated machine. The first World War held him back, but by 1920 he had produced a workable model, and by 1923 the Northeast Electric Company of Rochester had taken the machine over for development.

The first electric machine had been designed to operate from a power driven line shaft similar to that of a powered sewing machine. This was found to be a considerable handicap because it eliminated the flexibility and portability of the typewriter.

Northeast proceeded with the development of a motor to be a self contained unit in the power base. From 1925 to 1928, the company had actually built and sold 2,500 of these power units to Remington and other companies where they were assembled

A MACHINE NOW SUPERSEDING THE PEN

so read the following advertisement in the December 16, 1875, The Nation, for the Remington No. 1 typewriter:



The "Type-Writer."

A machine now superseding the pen. It is manufactured by Messrs. E. Remington & Sons of Ilion.

It is the size of a sewing-machine, and is an ornament to an office, study, or sitting room.

It is worked by keys, similar to a piano, and writes from thirty to sixty words per minute—more than twice as fast as the pen—in plain type, just like print.

Any one who can spell can begin to write with it, and, after two weeks' practice, can write faster than with the pen.

It is worked without effort, and is not liable to get out of order.

It is always ready for use, does not soil the hands or fingers, and makes no litter.

It is certain to become as indispensable in families as the sewing-machine.

Hundreds have come into use in the last few months in banking, insurance, law, and business offices, in the Government departments in Washington, and in private families, giving everywhere the highest satisfaction.

Editors, authors, clergymen—all who are obliged to undergo the drudgery of the pen, will find in the "Type-Writer" the greatest possible relief.

Young persons acquire the use with wonderful ease and interest. It fascinates them, and uses up devices comparable to it for teaching children to spell and punctuate.

There is, therefore, no other acceptable, instructive, or beautiful

CHRISTMAS PRESENT

for a boy or girl

And the benevolent can, by the gift of a "Type-Writer" to a poor, deserving, young woman, put her at once in the way of earning a good living as a copyist or corresponding clerk

No invention has opened for women so broad and easy an avenue to profitable and suitable employment as the "Type-Writer," and it merits the careful consideration of all thoughtful and charitable persons interested in the subject of work for women.

Many girls are now earning from $10 to $20 per week with the "Type-Writer," and we can at once put you good situations for one hundred operators in all parts of the country.

The public is cordially invited to call and inspect the working of the machine, and obtain all information at our store-rooms,

No. 707 Broadway.

WICK, YOST & BATES.

COPYING WANTED.

AGENCY WANTED.

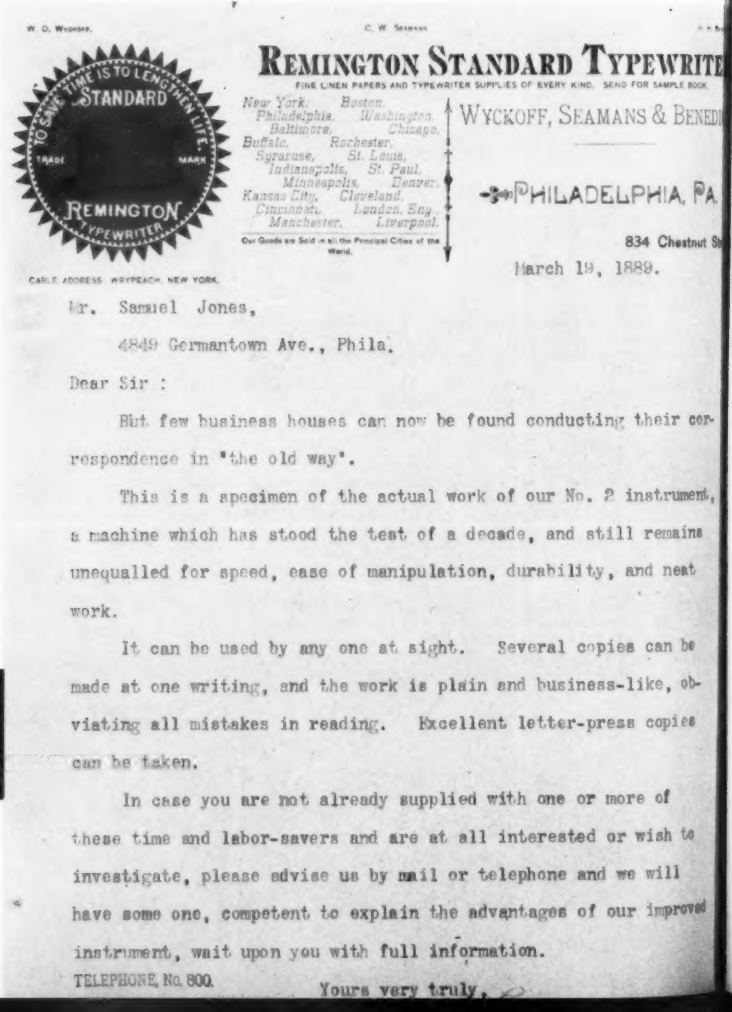
"TYPE-WRITER," No.

on ordinary typewriters and marketed. However, the electric drive made it apparent that for the fullest and best use, the typewriter would require redesigning.

In 1928, General Motors purchased the Northeast Electric Company, but the department manufacturing what was by then called "electromatics" (electric typewriters) did not go along with the deal and a new company, under the name of Electromatic Typewriters Inc. was formed.

In 1933, International Business Machines took over Electromatic and the Standard IBM Electric Typewriter, as we know it today, became a reality.

Since that time, all of the major companies have been, and are, producing electric typewriters for today's business needs.



W. O. Wyckoff. C. W. Seamans

REMINGTON STANDARD TYPEWRITE

FINE LINEN PAPERS AND TYPEWRITER SUPPLIES OF EVERY KIND. SEND FOR SAMPLE BOOK.

TO SAVE TIME IS TO LENGTHEN LIFE. STANDARD TRADE MARK REMINGTON TYPEWRITER

New York. Boston. Philadelphia. Washington. Baltimore. Chicago. Buffalo. Rochester. Syracuse. St. Louis. Indianapolis. St. Paul. Minneapolis. Denver. Kansas City. Cleveland. Cincinnati. London, Eng. Manchester. Liverpool.

Our Goods are Sold in all the Principal Cities of the World.

WYCKOFF, SEAMANS & BENEDI

PHILADELPHIA, PA.

834 Chestnut St

CABLE ADDRESS WRYPEACH, NEW YORK.

March 19, 1889.

Mr. Samuel Jones,

4849 Germantown Ave., Phila.

Dear Sir :

But few business houses can now be found conducting their correspondence in "the old way".

This is a specimen of the actual work of our No. 2 instrument, a machine which has stood the test of a decade, and still remains unequalled for speed, ease of manipulation, durability, and neat work.

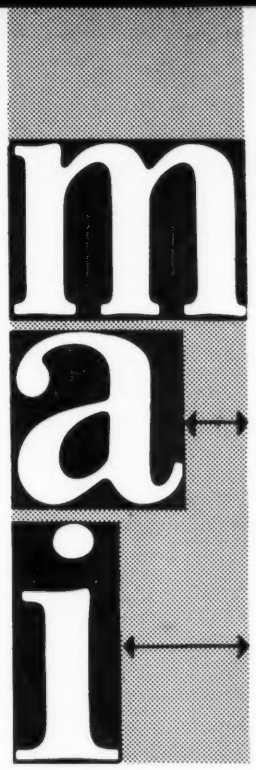
It can be used by any one at sight. Several copies can be made at one writing, and the work is plain and business-like, obviating all mistakes in reading. Excellent letter-press copies can be taken.

In case you are not already supplied with one or more of these time and labor-savers and are at all interested or wish to investigate, please advise us by mail or telephone and we will have some one, competent to explain the advantages of our improved instrument, wait upon you with full information.

TELEPHONE, No. 800. Yours very truly,

AN EARLY SALES PROMOTION LETTER

Written by Wyckoff, Seamans and Benedict in 1889, the then Sales Agent for Remington.



LIMITATIONS

Type designers for the modern typewriter have always looked toward achieving the perfection of the printed page.

Four factors make this difficult.

1. Differential or proportionate spacing.

The characters of the Roman alphabet vary in width; the letter "I" is narrowest and the letter "W" is widest. The ordinary office typewriter permits the carriage movement in a set series of spaces as it writes—all exactly the same. Thus the type characters are, of necessity, distorted to fit into the non-varying spaces, and the amount of space between letters naturally varies.

As early as 1881 the Crandall Typewriter Company was working on a proportionately spaced typewriter. Over fifty years passed before even a modest success was achieved. Even today, IBM, the only company in production on a proportionate spaced typewriter, uses only a four unit proportional setting as against regular typesetting on a Linotype, which uses from twelve to seventeen units.

All other major companies are close to production on a proportional space machine but, as yet, none has actually marketed its model.

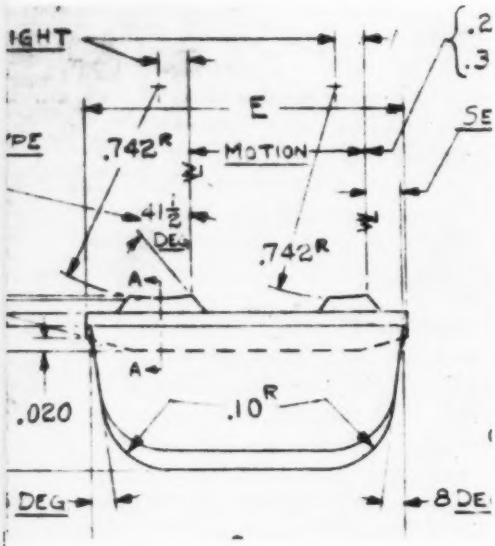
COMPARISON BETWEEN ORDINARY AND PROPORTIONAL SPACING

iiiii
OOOOO
WWWWW
mmmmm

Ordinary 10 pitch typewriting.

iiiii
OOOOO
WWWWW
mmmmm

Proportional spacing, using 2, 3, 4 & 5 units.



DRAWING OF A TYPE SLUG,

showing the curvature on both upper and lower case letter.

2. Justification of right hand margins.

Since words vary in size, the right hand margin formed in a column of lines will normally always be uneven. In ordinary printing, hand or machine composition overcomes this by inserting increments of metal between words, thus stretching each line out to a pre-selected width to form an even margin. This is, of course impossible on a regular typewriter.

Both IBM and Vari-Typer sell machines that will achieve right hand alignment with double typing. Most of the other companies can supply an attachment that has a six space bar that will justify right hand margins on the second typing.

3. The curvature of the typewriter platen or roller, necessitating the curvature of the typewriter type to give a perfectly imprinted surface.

4. In ordinary printing, ink is applied directly to the printing surface of the type.

In typewriting, to obtain an imprinted surface the type is pressed against an inked ribbon (silk, nylon or carbon paper) and the impression is made through the ribbon. This spreads the impression and, on a type face cut to .002 of an inch the final width of impression, when made through a cloth ribbon, can go as high as .011 of an inch.

.....

The search for the perfectly typed page has almost completed the full cycle. IBM was recently asked to supply a type face that would get away from the printed look that the proportional spaced typewriter produces. This was simply accomplished by squaring the serifs on the upright letters which allowed for more white space between the letters.

William A. Dwiggins is well-known for his work as a type designer, illustrator and book designer. His studio is in Hingham Center, Massachusetts.

In 1940, PRINT asked Mr. Dwiggins for his comments about designing typewriter faces. His answer, reproduced here in his own handwriting, sets out some of the difficulties and limitations in designing new faces for the modern typewriter.

I laid this over (yours of Aug. 27. 40) to think about it, and it got buried.

The matter of typewriter type has always interested me, of course. In '32 '33 a fellow in Underwood-Elliot-Fisher: H. R. Leonard, then Asst. to the Pres.: and I went through a long course of sprouts with a face I drew and he cut and mounted on a machine. His colleagues didn't see things as he did and in May 33 the whole thing had to be dropped. . . . Too dead to revive.

In '37 Eugene B. Power of Edwards Brothers, Ann Arbor, Mich. got interested and wanted me to make something. But his interest was in developing a face for use in plano-lithographic book-printing, with the idea of working out a machine with 3 or 4 automatic spacings. His efforts, already made, had turned up nothing but a dismal parody on letterpress printing, and I couldn't see that merely designing new type would improve things any — the faults were in another place entirely and couldn't be corrected that way.

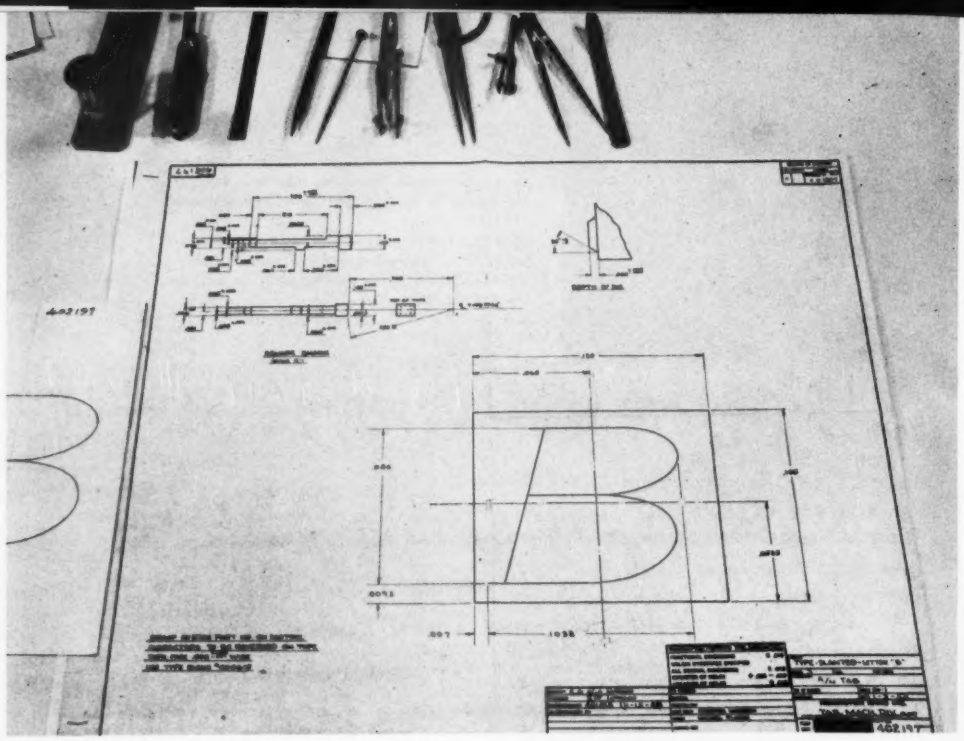
My interest was in taking the type-writing machine just as it was — single-dimension escapement and everything — a machine for writing letters, not for composing books — and making it have style within its own mechanical limitations. With the 3 dimension escapement stuff: (i o m 7 2 3) you get only a cheap imitation of real type and lost all the "typescript" style. etc. etc. So I didn't go into it.

If you have any friends in the middle of the type-writer game, I'll be glad to do something with you and them.

An article for PRINT — maybe later, when something possible has emerged in the way of good typescript style. Better do something before you talk about it, what?

Bill

January 17 1941



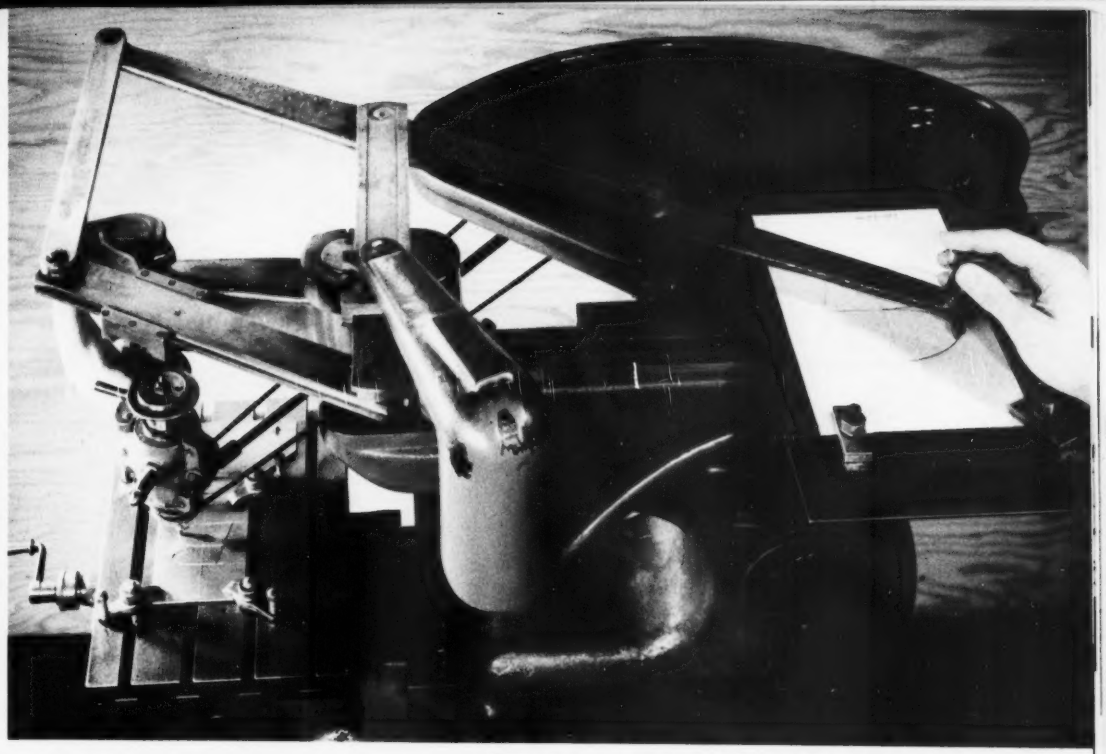
DESIGNER'S DRAWING TABLE—On this drawing the designer usually includes directions to the matrix cutter as to the angle of cutting.

DESIGN AND MANUFACTURE OF TYPE FACES

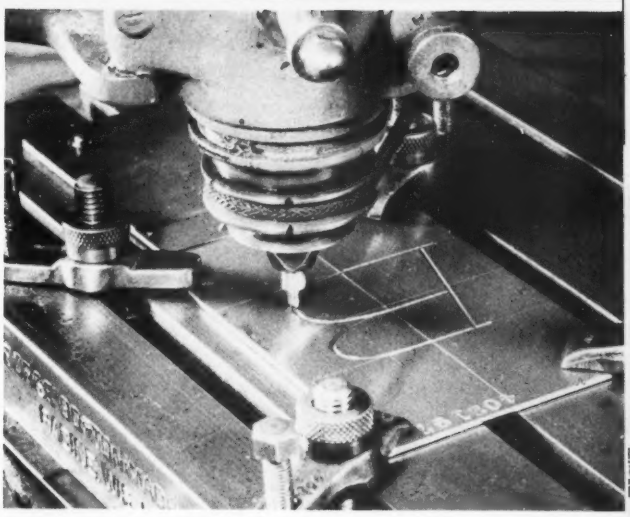
Early manufacture of type followed the conventional method of moulding the characters, as is done in casting printer's type.

However, the excessive wear, particularly on the vowels, necessitated a new method of type manufacture. Basically, all the companies use the same method now of pressing soft low carbon steel into a matrix or die, and then hardening and plating the actual type for use on the typewriter.

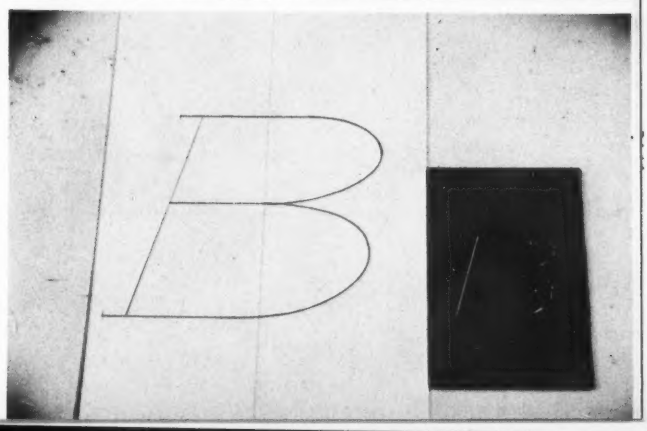
Basic steps in this process are shown in the following pictures specially photographed at the Remington-Rand typewriter factory, Elmira, New York.



CUTTING TEMPLATE—On the working pattern, in the upper right hand corner, the operator follows the character on the pattern with a stylus, and at the same time the character is being cut into the metal template lower left.



CLOSE UP OF SLANTED LETTER "B"—being cut in the metal template on the pantograph.

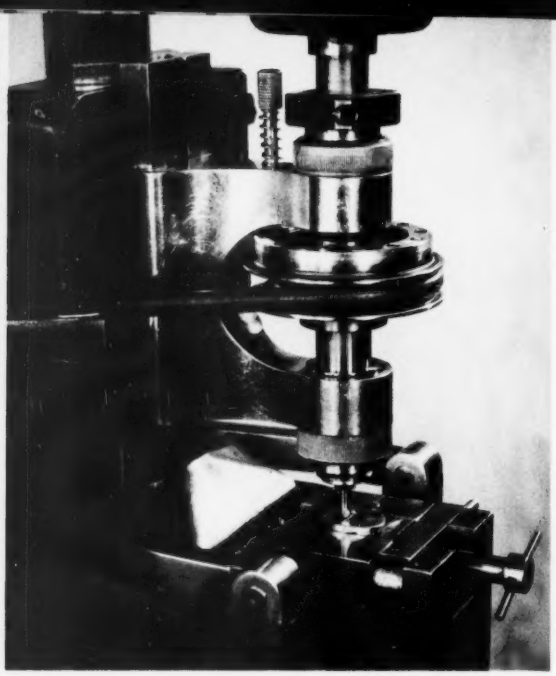


WORKING PATTERN AND FINISHED TEMPLATE—Original drawing is usually 50 times finished type size. Template 2¼ times smaller than original drawing.

CUTTING THE MATRIX—The engraving machine in operation showing the character being cut into the die.

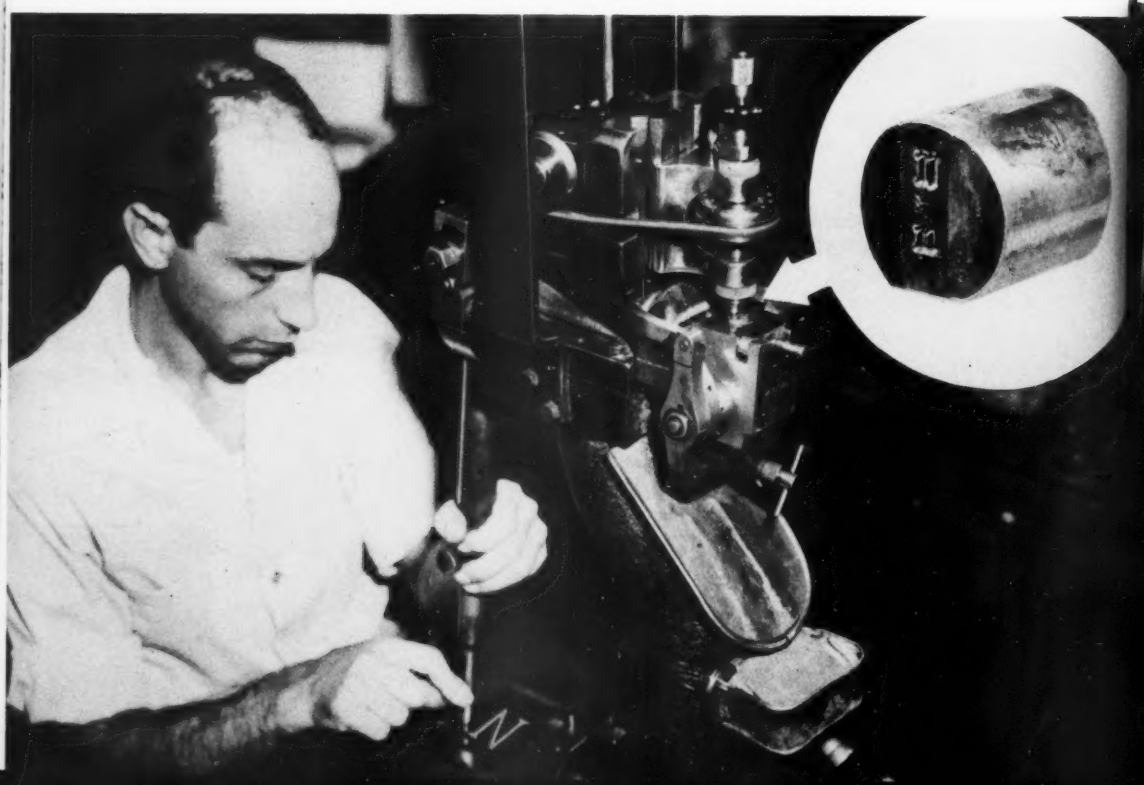
The metal template is at the lower left and the operator is following the character with the stylus.

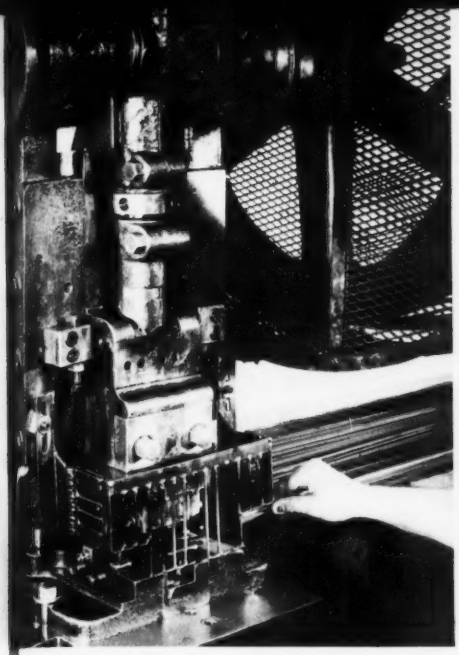
Upper right, the character is cutting into the die.



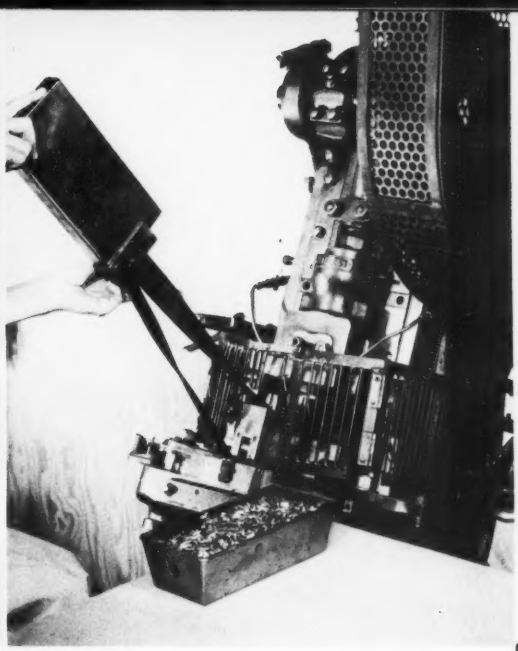
CLOSE UP OF ENGRAVING MACHINE—showing the cutting tool engraving the character into the type die.

CLOSE UP OF DIE—(right) showing head of die with upper and lower case characters. The face of the die is the size of a 25-cent piece. The characters in the die are 20 times smaller than the characters on the template.





↑ CUTTING OF SLUGS—in soft low carbon steel from 20 foot lengths.

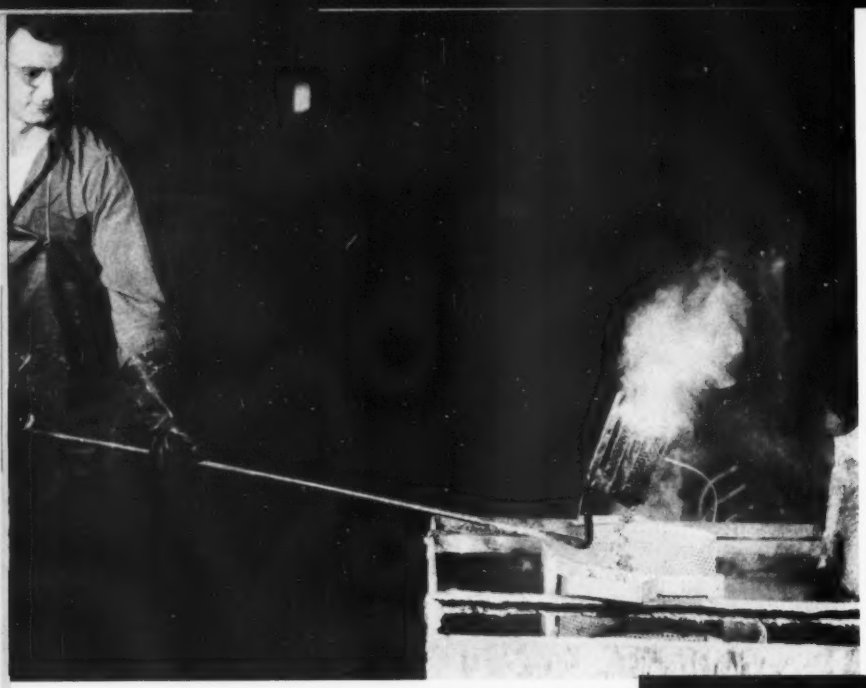


↑ FOLDING THE EDGES—of the type slug so that it will fit around the type bar.

Operator placing a type slug in the machine that holds the matrix and pressing the matrix into the soft rolled steel slug.

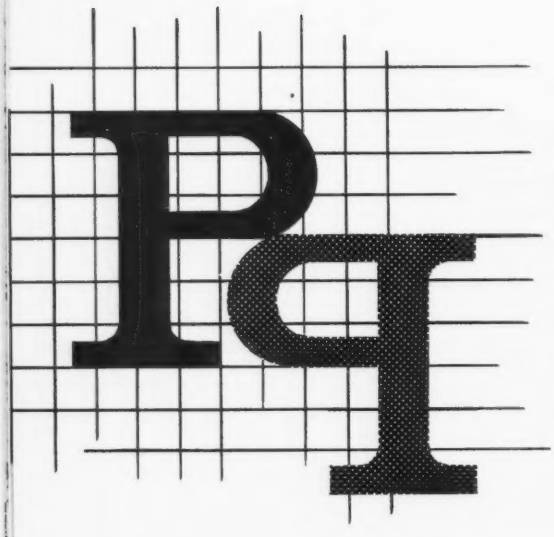
This is a kneading action under 11 tons pressure. The machine rocks the steel into the matrix to insure perfect contact.

During the rolling or kneading operation, some of the soft metal is squashed out of the die, and in this picture the excess metal is being trimmed from the type slug.



Type slugs are given a hardening bath in cyanide heated to 1600°.

Here the basket of slugs after leaving the cyanide is being quenched.

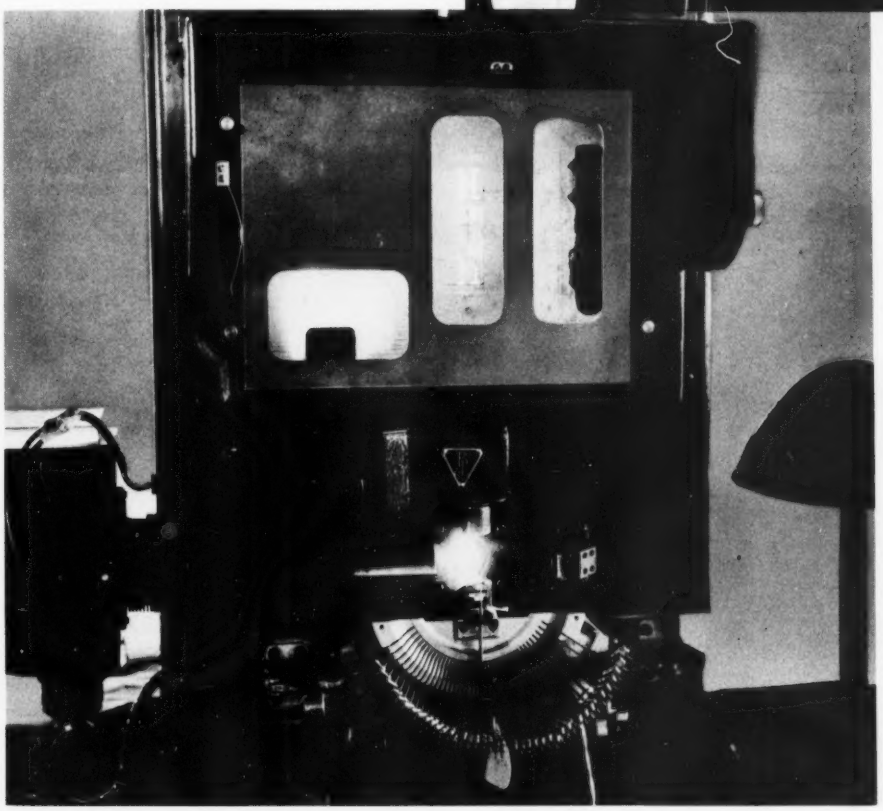


After cooling, the type slugs are placed in a basket for immersion in a cadmium plating bath to further harden the printing surface.

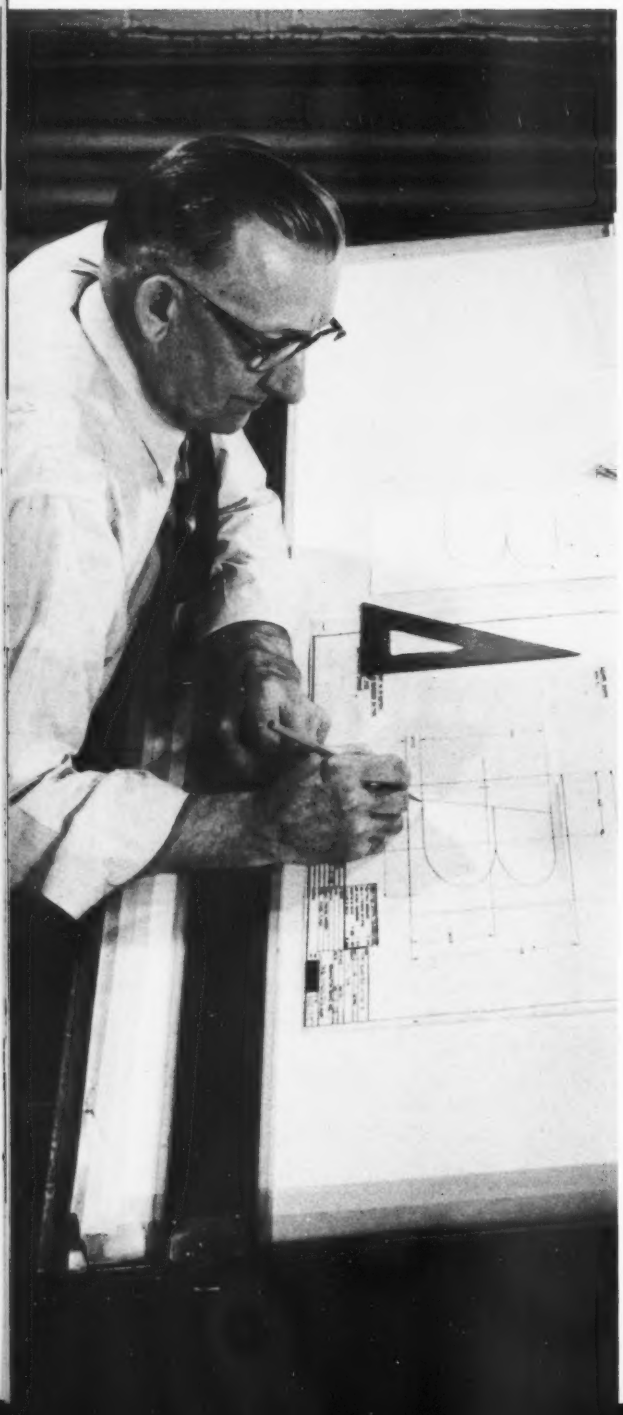
When cool, each type slug is inspected.

ALIGNMENT MACHINE—After the type slugs are placed on a typewriter, the machine undergoes an alignment test.

Each character, as the keys are depressed, comes up and the image is thrown in enlargement on a screen marked for alignment. Any deviation is immediately noted and corrected.



TYPE DESIGNERS AND ENGINEERS



Out of the hundreds of typewriter faces available to modern business, only two are named after their designers – – – Rogers and Galvin.

Millions of dollars have gone into improving the mechanical aspect of the typewriter but the man basically responsible for the "impression on paper" has in the past been "a voice crying in the wilderness".

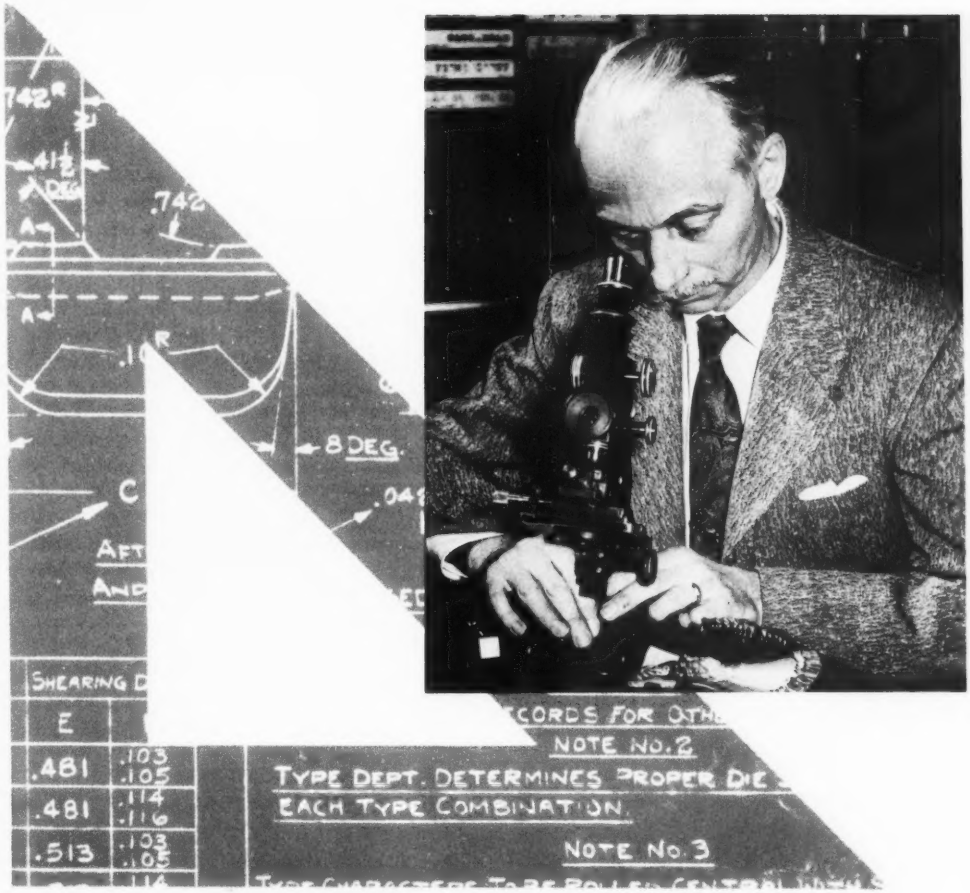
Only a few of the companies have made a determined effort to produce new type faces to back up the huge sums spent on mechanical research. For the most part, the companies have been satisfied to adapt established printers' types to the typewriter. But now, with modern business recognizing the part that the typed message can play in selling "business" itself, they are becoming more aware of the need for research and production of new Typewriter Type Faces.

PRINT presents a gallery of the men whose designs are daily read and used by millions.

FLOYD ADAMS – Chief Type Designer at the Remington Rand plant, Elmira, New York.

Adams has 45 years of experience in Type Design and production – the oldest (in point of service) of any of the typewriter type designers. He estimates he has worked on the development of over 30,000 type patterns.

A master craftsman, in his work, he has developed every thing from special trademark keys to faces and keyboards in Burmese, Cree Indian, Bengali and the Devanagari languages.



TORSTEN BAUDIN, Head Designer for Underwood Corporation in Hartford, Connecticut. He has held the title of Engineer of Type Development and Type Manufacture since 1931.

Born in 1889 in Sweden, and a graduate (M. Sc. Tech.) of the Royal Institute in Stockholm, he brings a scientist's approach to the problem of type design.

A recent accomplishment has been the creation of the large size Video type for the Teleprompter machine developed by Underwood (see Page 42).

C. P. SMITH, No. 2 Type Designer in I.B.M.'s Production Engineering Department at Poughkeepsie. Joined the Company in April, 1945.

His youthful bow-tie look belies this serious designer who has been responsible for I.B.M.'s Executive, Copper Plate and I.B.M. Executive Mid-Century face.

W. A. HEIDERICH, Head Designer for International Business Machines joined their Production Engineering Department in 1941 as a type designer.

Now in charge of all type development for I.B.M., he works out of the Poughkeepsie, New York, plant.

Young, but scholarly looking, Heiderich has contributed two major type designs to the I.B.M. list: Executive Modern and Executive Text.

He is a graduate of the class of '38 of the Rochester Institute of Technology where he studied the Fine Arts of Painting, Designing and Sculpturing.

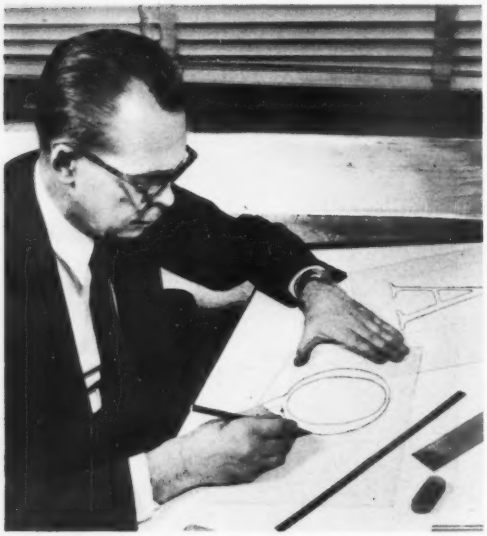
J. A. HAMMEL, 25 year old veteran of the Royal Typewriter Company, is now Supervisor of Service in charge of Type Manufacturing Process Methods and the development of new type style formation.

During the past five years has successfully designed type styles in the Arabic, Iranian and Hindi languages.

ROBERT WILSON GALVIN earned his way through Berea College, Berea, Kentucky, as a printers' apprentice, from there to Assistant to Carl P. Rollins, Printer to Yale University, and then to the Army Map Service in Washington, D.C.

About his face "Galvin" created for Justowriter, he says in the new Penrose Annual:

"Designing the "Galvin" type face for the Justowriter presented two main problems: 1) Conforming to the mechanical limitations imposed upon the designer by the machine itself (an advantage in that it gave me some rules to go by and discipline my actions) – 2) Creating new letters based on the traditional form which our reading habits demand."



BENTLY RAAK, 47 year old, Iowa born designer for Vari-Typer, has been through the whole printing mill.

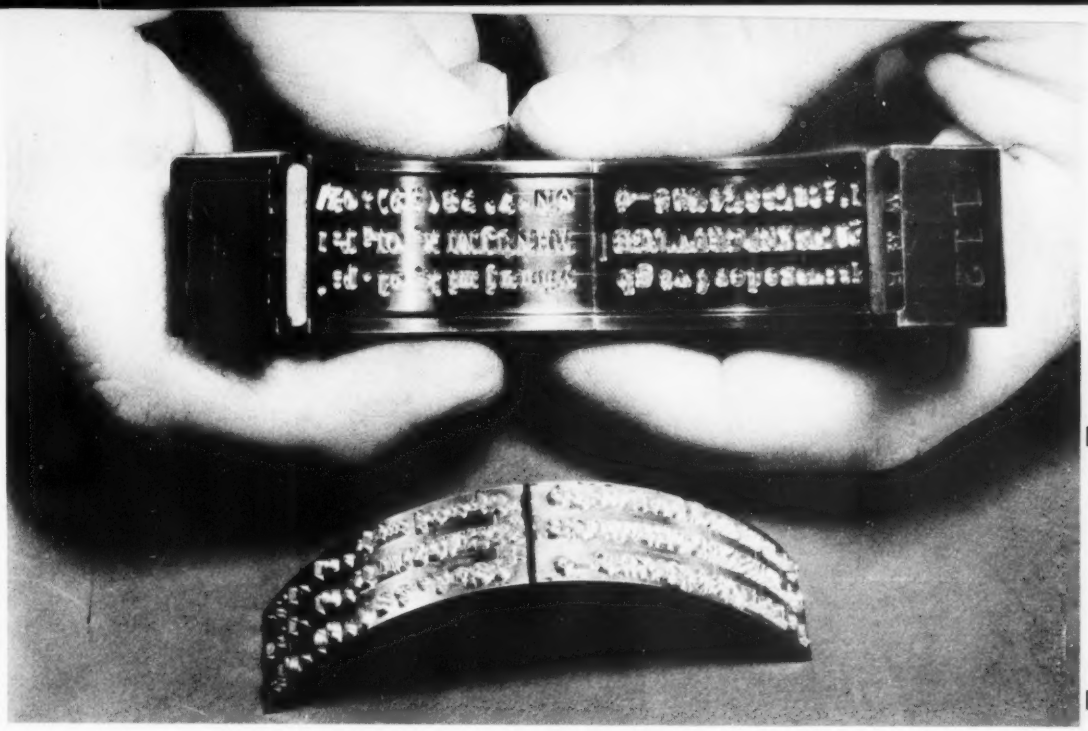
A student of Goudy's, he still speaks with reverence in his voice when "the Master" is mentioned, and never mentions his name without the prefix "Mr.".

Raak attended South Dakota State which was one of the first colleges to combine journalism and printing with a liberal arts course. He has been an assistant art editor for McCalls, art director for an advertising agency, and taught printing technique, advertising layout and news photography at Syracuse University. Served with the O.S.S. during the War and has been with Ralph C. Coxhead Company since 1940.

BRUCE ROGERS, "the Dean of American book designers", is responsible for adapting his Centaur type for the Justowriter. (Commercial Controls Company.)

Taking into consideration the limitations of only five different widths of letter available on the Justowriter, Mr. Rogers managed to preserve the character of the original design of the Centaur type.

Indiana born in 1870, 82 year old Bruce Rogers is still active in the field of book design.



THE VARI-TYPER

VARI-TYPER TYPE MATRIX AND TYPE FONT

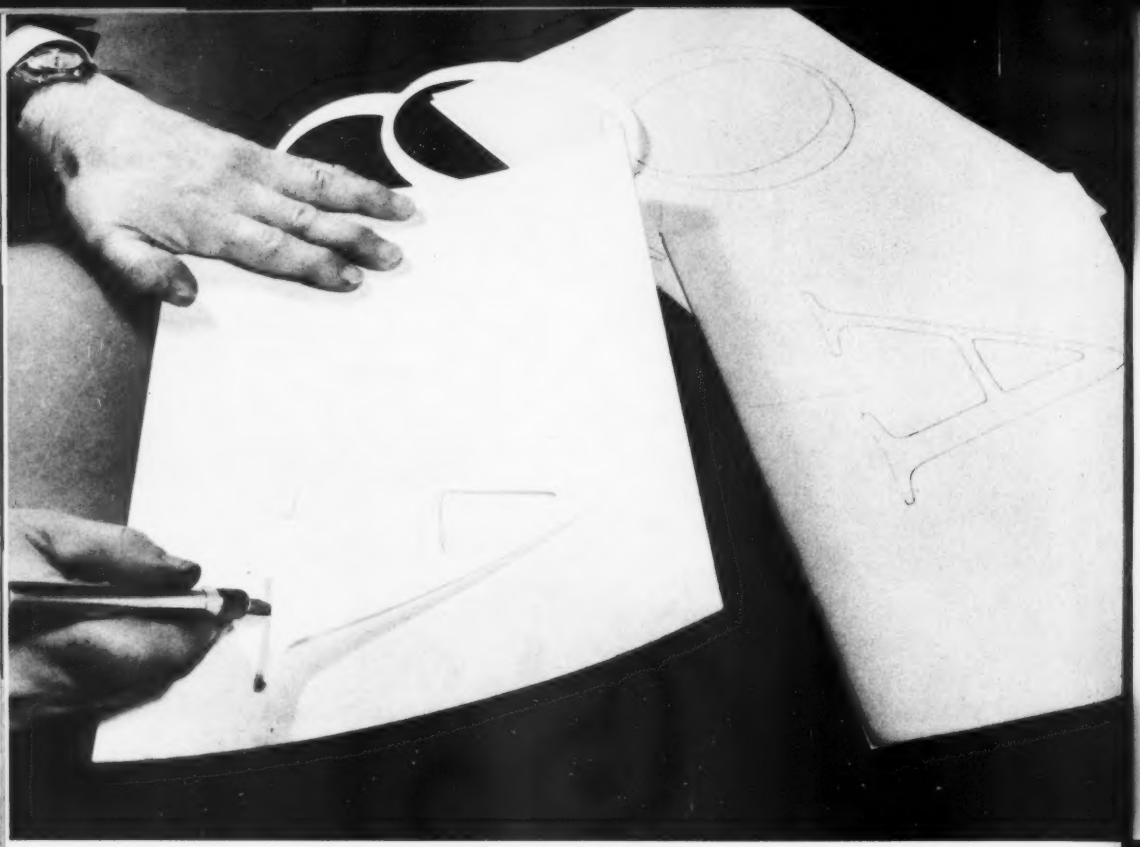
Each font bears 90 characters which contains not only the Upper and Lower case of the alphabet, but also ligatures, fractions and commonly used symbols. Originally the fonts were made of moulded Bakelite but are now constructed of a hard metal alloy. The fonts are moulded or cast as contrasted with typewriter type which is pressed from soft steel.

Among the many treasures owned by the Metropolitan Museum of Art probably the strangest and rarest was a nearly defunct typewriter company.

When the one time Civil War Correspondent, Inventor J. C. Hammond died in 1913 he willed the Metropolitan his patents to the Hammond typewriter. Invented in the early '80's the Hammond was the first typewriter to attempt to utilize a changeable type-bar. The machine was bulky and the keys were set in a circle – making the "hunt and peck" system imperative.

Never a complete success the machine and its patents were bought from the Metropolitan by the Frederick Hepburn Company who renamed it "The Vari-Typer". Bankruptcy followed and in 1933 Ralph C. Coxhead, then a mechanically minded business machine salesman, along with a group of investors bought the company.

Assisted by Charles W. Norton, Coxhead set out to lick the many problems that had defeated their predecessors. Four years later in 1937, with a metal type font instead of

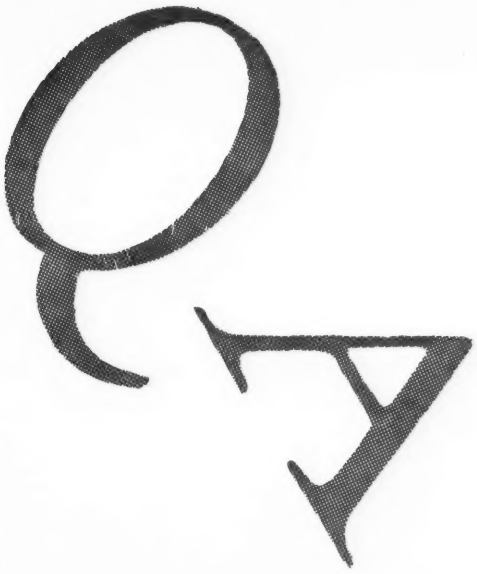


Bakelite, a brand new carbon paper ribbon roll instead of cloth, right hand justification and nearly 3,000 other changes, the Vari-Typer was ready for the market.

Slowly the company expanded until the Chicago newspaper strike of 1947 gave them the chance to show what "Cold-Type" could do. Until the strike's end two years later Chicagoans read a "Vari-Typer newspaper". With this push the Ralph C. Coxhead Corporation has expanded into a world wide sales organization selling the "gospel of Cold Type and photo offset printing".

PATTERN MAKING

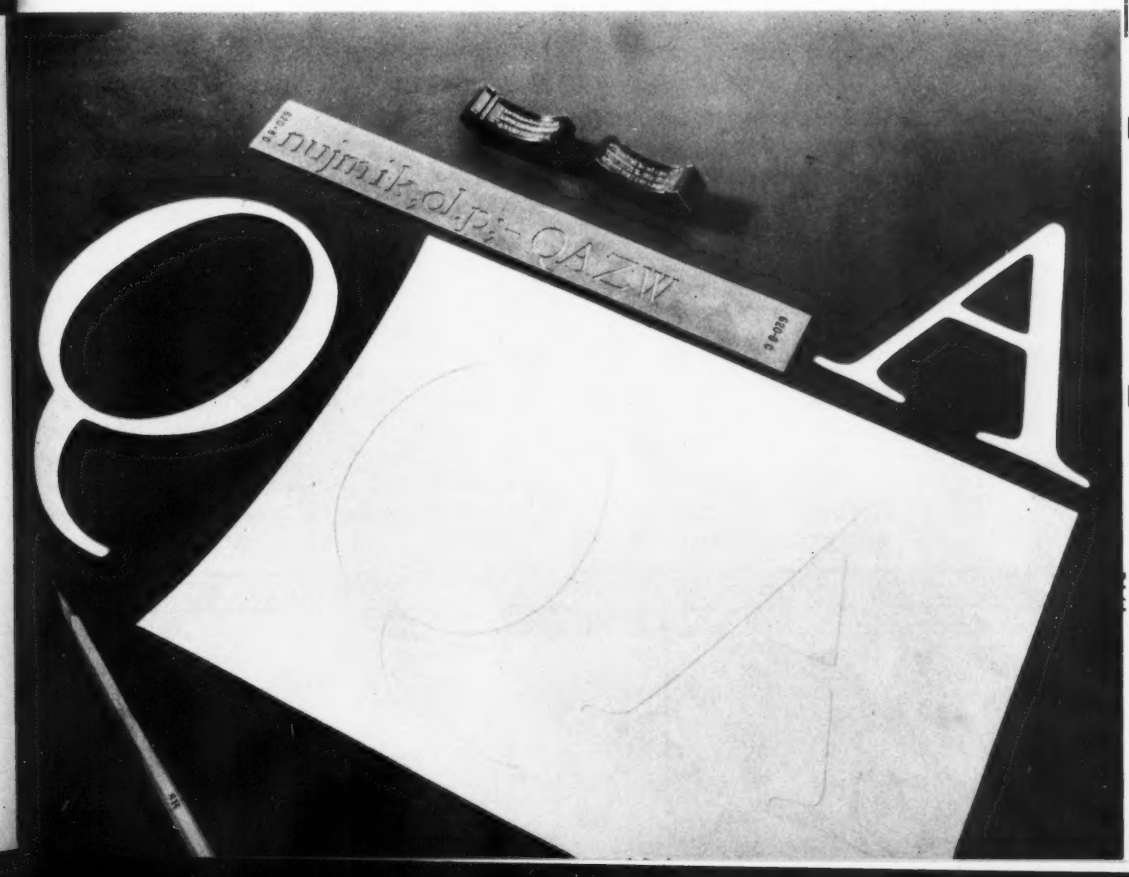
The Goudy technique of making a paper pattern from the master-drawing is used by the Coxhead Company. A 50 to 1 drawing is first made on tracing paper and transferred to light Bristol board. The letter is cut out with a sharp blade and the Bristol board cut-out pattern is cemented to heavy stiff board. From this paper pattern a 6 to 1 brass working pattern is engraved by tracing with a stylus on a pantograph connected to the engraving tool. The final matrix is similarly cut from the brass pattern.

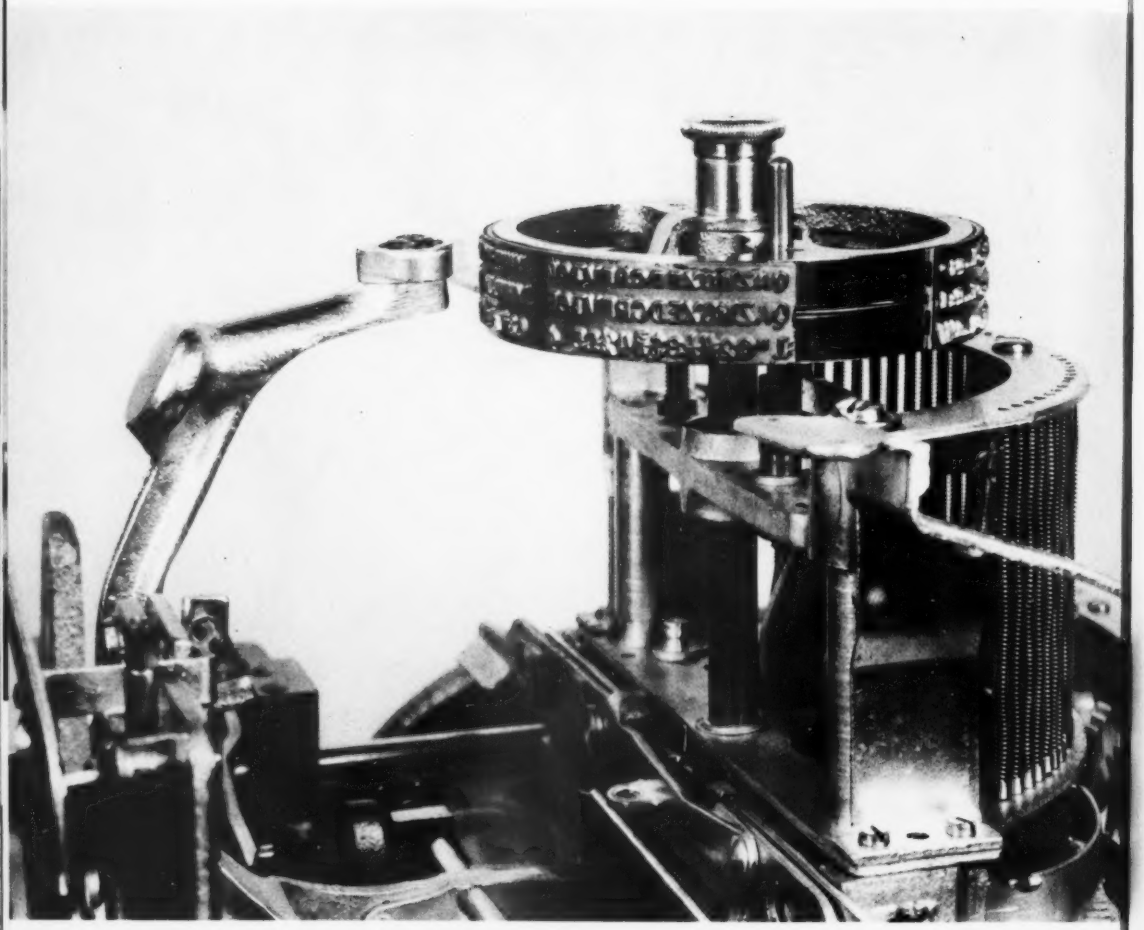


THREE STEPS IN CUTTING A VARI-TYPER FONT

The paper pattern (with cut-out letters); the metal working pattern; and the steel matrix (pencil for scale).

The designer's plans and instructions as to height of letter, stem thickness and serifs are maintained by the engraver to an accuracy of .0003.





PRINTING TECHNIQUE

Depressing a key moves the type font into position for a letter to print, then the steel hammer (at centre left) comes forward to strike in the same clam-shell action as on a platen press. Composition paper and carbon paper ribbon are between type font and hammer.

VARI-TYPER

Stressing the phrases "Cold Type" and "the Office Composing Machine" the Ralph C. Coxhead Corporation has been a major factor in the fast moving trend to photo-offset printing.

With 725 interchangeable and different size type-fonts most printers' types are available through the Vari-Typer for regular office use.

The Vari-Typer has a standard typewriter keyboard, tabulation keys, platen releases and carriage return levers. The spacing, leading, impression, column-width, margin justifying are dial selected or set by a gear shift and finished copy is a repro-proof ready for the offset camera. The machine can turn out finished copy for office forms, catalogues, brochures, books and even advertisements.

The Hammond (Circa 1887)

The Vari-Typer DSJ

SPECIAL USES

Today's multiplicity of forms, invoices, statements, estimates and reports create many difficulties for American Business. Thousands of these reproduction problems have been solved by the ingenuity of the typewriter companies.

Specially designed type faces for manifold billing that give maximum legibility on up to 12 or 15 carbons — special machines for department store use that will write figures on tags both laterally and vertically — combination of type faces for debit and credit — (Roman and Italic face — for example) — these and other special designs for business demonstrate the typewriter's versatility and adaptability.

ELITE SEMI GOTHIC
12 Pitch
33 Tooth Ratchet

Dun & Bradstreet had Royal create this face for their business reports. It was later adapted on all the company machines as a readily identifiable trade mark. Now in general use.

Royal Elite Semi Gothic is a beautifully formed type of Gothic design. This distinctive style is slightly less formal than other Gothic types. The characters are very well balanced so that space inequities are kept to a minimum. Elite Semi Gothic is well adapted to the typing of reports, restaurant menus and out-of-the-ordinary business letters.

The numerals are good looking and manifold well.

1 2 3 4 5 6 7 8 9 0
1234567890

Notice how easily you can read the following paragraph.

"Your typewriter was designed to make typing easy for you. To get the best use out of it, you should be thoroughly familiar with its operating controls. If you have the manufacturer's instruction book that came with your typewriter, we suggest that you study it thoroughly and acquaint yourself with the purpose and operation of each of the various devices on the machine."

Letters typed with this style have 12 characters to the horizontal inch and approximately 7½ lines to the vertical inch.

MODIFIED PRU DOUBLE GOTHIC
12 PITCH
28 TOOTH RATCHET

Elite Single Gothic Pru and Modified Pru Double Gothic specially designed for Prudential Insurance. This type face is now available from all companies but for many years was exclusively supplied by Royal.

ROYAL MODIFIED PRU DOUBLE GOTHIC IS A TYPE ESPECIALLY DESIGNED FOR POLICY WRITING. THIS TYPE FACE IS SLIGHTLY BROADER THAN STANDARD AND RESULTS IN GREAT LEGIBILITY AND EASY READING.

HERE IS A SAMPLE OF THE KEYBOARD.

" # $ % _ & ' ( ) *
2 3 4 5 6 7 8 9 0 -

Q W E R T Y U I O P ¼
Q W E R T Y U I O P ½

A S D F G H J K L : @
A S D F G H J K L ; ¢

Z X C V B N M , . ?
Z X C V B N M , . /

WITH ROYAL MODIFIED PRU DOUBLE GOTHIC A SECRETARY CAN TYPE 12 CHARACTERS TO THE HORIZONTAL INCH AND 6 LINES TO THE VERTICAL INCH.

OLD ENGLISH TYPE
9 Pitch
25 Tooth Ratchet

Small business can be enterprising — Keen's English Chop House had this special Old English Face specially designed for their menus and correspondence. They held exclusive rights for five years. The face is now available generally.

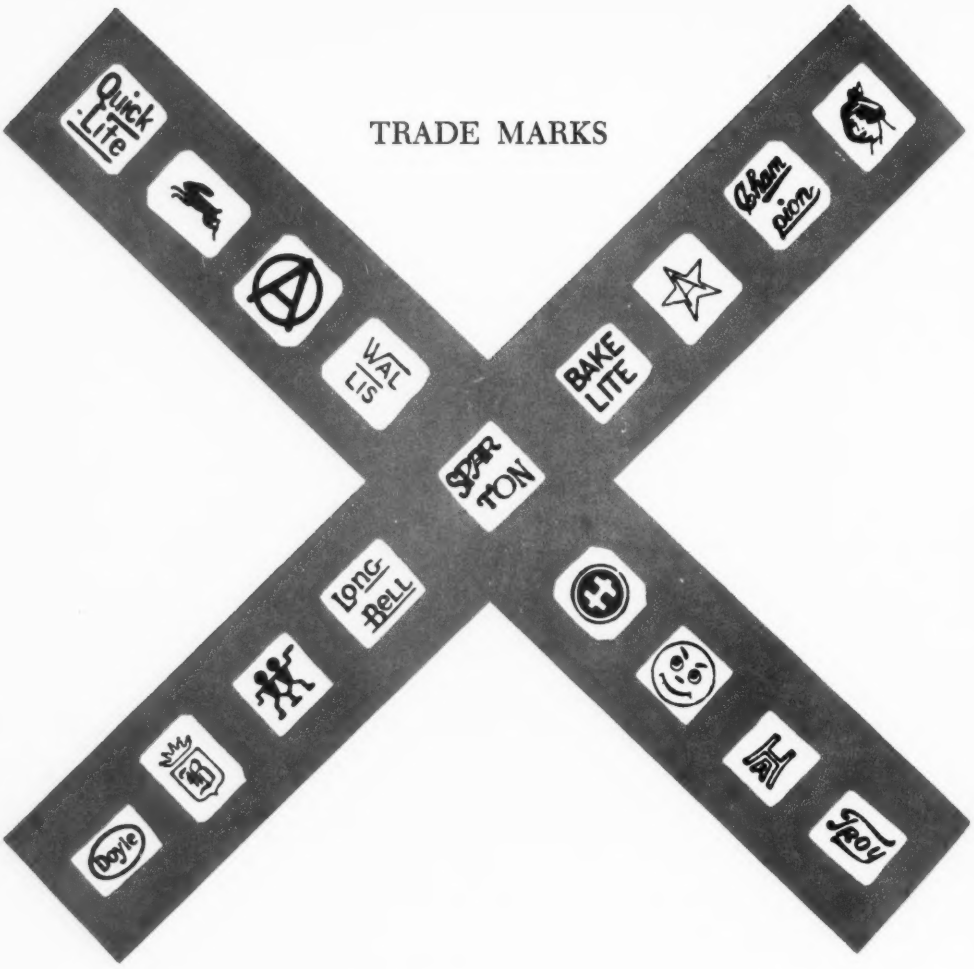
Royal Old English is a beautiful period type style. It is designed for typing diplomas, certificates and other notices where its style will add beauty and dignity. Although the many serifs of this type and Old English design have been faithfully reproduced, this type style is very easy to read.

The numerals are also attractive in design and are clear cut and legible.

1 2 3 4 5 6 7 8 9 0
1234567890

With Old English, a secretary can type 9 characters to the horizontal inch and approximately 5 3/8 lines to the vertical inch.

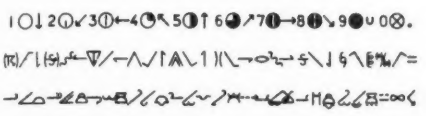
TRADE MARKS



Many companies have had their trade-mark especially cut and fitted on their business typewriters. This is a simple and inexpensive means of product identification not too commonly used. The special and usually oversize key is mounted on the far right of the keyboard so that the overhang does not impede the working of the other keys.

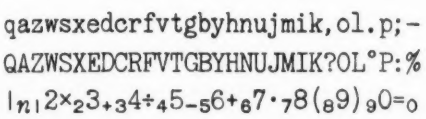
In the case of the script lettered trade-mark used by SPARTON RADIO, the uppercase section of the type bar carries the letters SPAR and by depressing the shift key these letters are printed in one stroke. This only moves the carriage one space and the space bar must be struck three times to clear space for the letters TON to complete the readily identifiable SPARTON trade-mark.

Many large companies with numerous branches assign a special code key for easy identification of branch correspondence in the Head office.



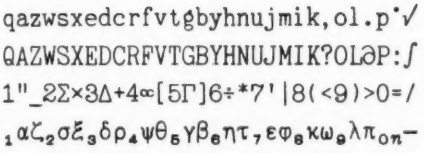
WEATHER

Used for daily weather reports, this face gives a maximum of information with a minimum of writing. By striking three keys the following information can be printed: A stormy day with the wind coming from the North-east.



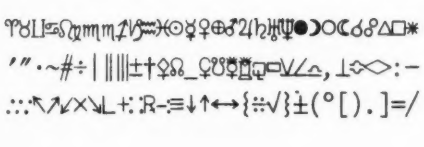
CHEMISTRY

Standard designs are available showing regularly used chemical formulae but specially created faces for specific industries are an every-day problem to the Typewriter Type Designer.



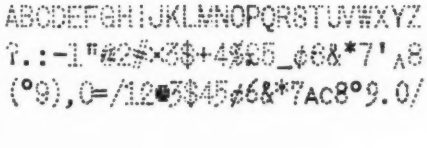
MATHEMATICS AND ENGINEERING

Particularly useful in the field of Mathematics and Engineering the specially created type faces preclude mistakes made from carelessly written symbols — and are a great time saver.



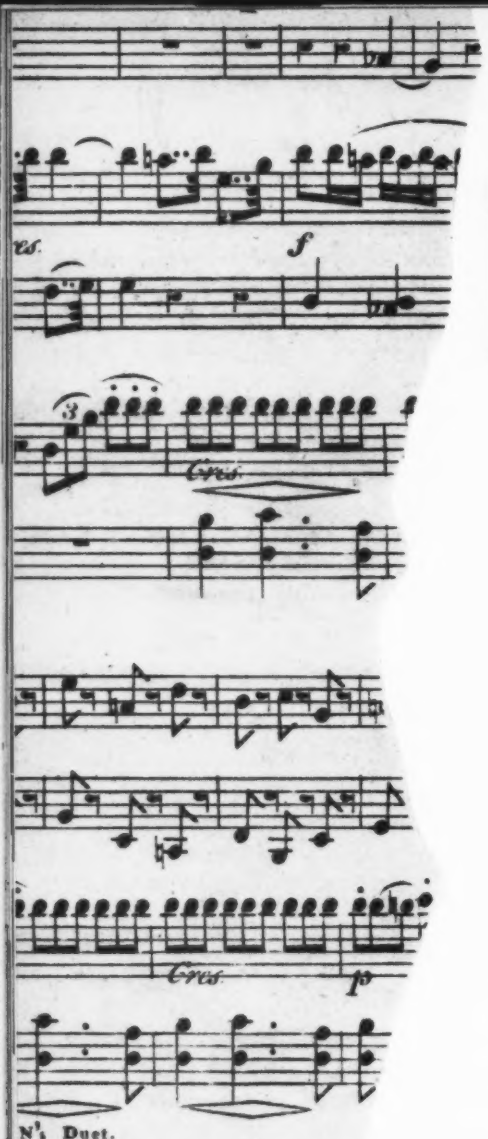
SCIENCE

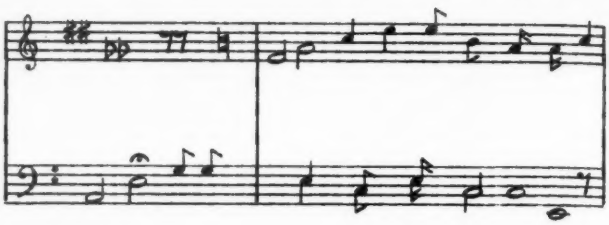
Writing in a language of his own, the scientist often needs to reproduce a limited number of copies of his work and the typewriter companies have here again helped with a solution.

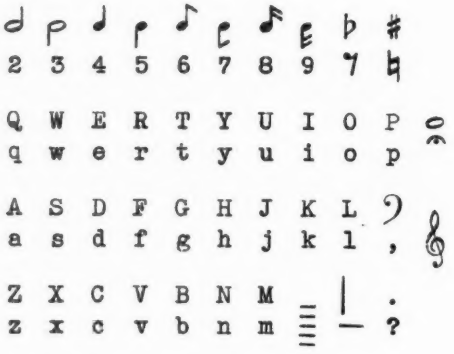


CHECK WRITING

Used with an indelible ribbon this pinpoint type punctures the fibres and puts the ink deep into the paper, making a check completely tamper proof.





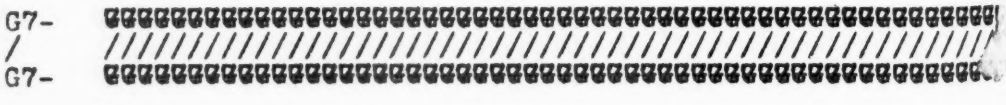


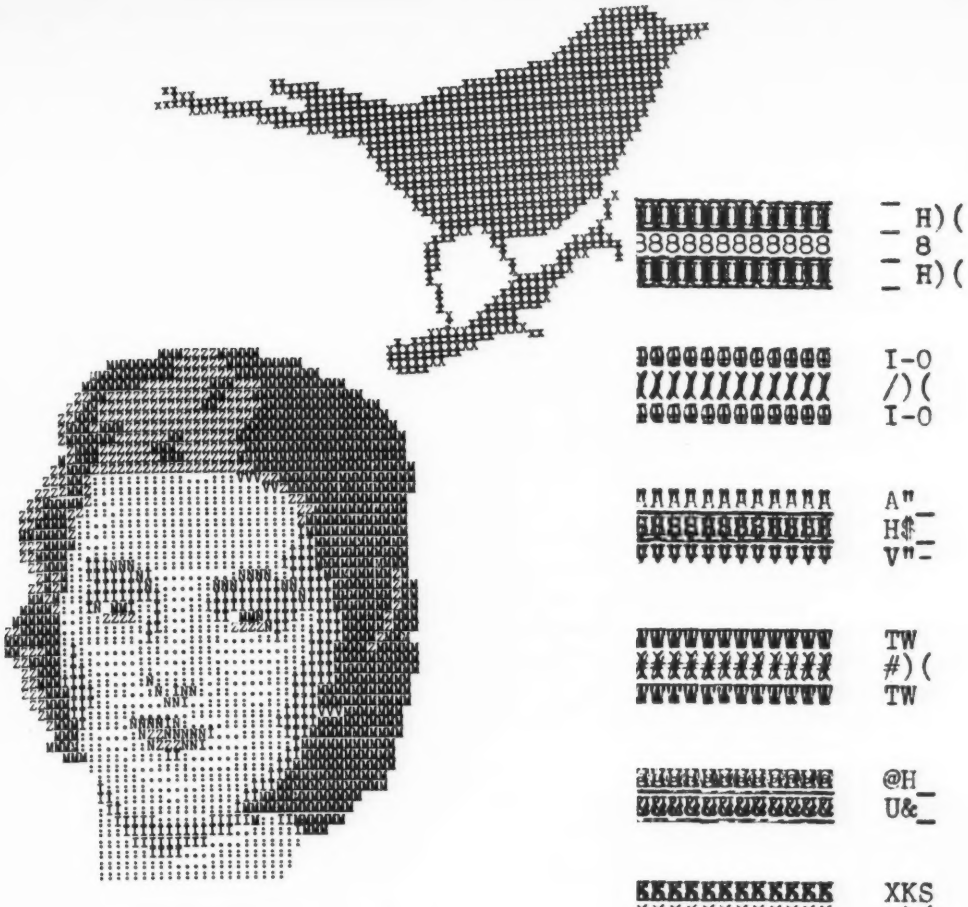
Keyboard arrangement of Underwood music typewriter.

MUSIC TYPEWRITERS

Many of the companies have produced typewriters that will, by continuous striking, form solid music bars. All notes can be placed on any of the five bars or spaces as desired. Clefs, sharps, flats, numerals and a regular upper and lower case alphabet are included on the keyboard.

Few of these machines have been manufactured and those in use are usually rented by companies to make clean copies for reproducing a limited run of a music score.





ORNAMENTAL OR ART TYPEWRITING

Still used as a training practice for aspiring stenographers "Ornamental or Art Typewriting" is basically an inexpensive method of dressing-up mimeograph or offset copy.

Ingenuity, perseverance and plenty of time seem to be the prime requisites for turning out these borders, designs and even pictures.

Gregg Publishing has produced two books on the subject, Flanagan's "Ornamental Typewriting" and Nelson's "Artyping."

Light and DARK

One weakness of the typewriter in the past has been the inability of typewriters to give emphasis to certain imprinted words in the preparation of copy for offset printing. Remington Rand with a new device called "The Dual-Rite" has helped to solve this problem. "The Dual-Rite" is a simple attachment that brings into play a special un-inked fabric ribbon and when a heavy impression is needed the key strikes through the fabric to a carbon paper ribbon onto the paper.

The first use of the device has been in typewriter-set telephone directories. A more general use is in the preparation of manuscripts and copy for printers and typesetters. It will enable the writer to automatically indicate type style changes and eliminate "hard-to-read" underscoring.

If no answer call Stamford-48-0916
Riverside Yacht Club ofc Club Rd Rvrsde....7-1706
Junior Club House Club Rd Rvrsde 7-1988
Page Calls Club Rd Rvrsde 7-1937
Robb Gene Lockwood Rd Rvrsde.....7-1138
Robbins N O 12 Eisenhower.....7-0744
Roberson John E 56 Havemeyer La.....7-2753
Roberti Angelo 29 Mianus Village Rvrsde....7-0407
Roberts A T 5 Grant Av.....7-1879
Roberts C F 89 Shore Rd.....7-2353
Roberts D H Greenwich Cove Dr.....7-0776
Roberts E E 29 Marshall.....7-2621
Roberts John 32 Arnoid.....7-1176
Roberts Lawrence 65 Center Dr.....7-2229
Roberts Lawrence M 29 Grimes Rd.....7-1175
Roberts R B Spezzano Dr Rvrsde.....7-2401
Roberts Weldon Mrs Lockwood La Rvrsde.....7-0033
Roberts William E 258 Sheephill Rd Rvrsde..7-2491
Robertson B D 48 Shore Rd.....7-2843
Robertson Gordon F Dr 15 Arnold.....7-2725
Office 30 Millbank Av Greenwich-8-6644
Robertson Lawrence Dr Summit Rd Rvrsde.....7-0926
Robinson Charles 30 Sheephill Rd Rvrsde....7-2055
Robinson Charles T Knoll Rvrsde.....7-2105
Robinson Frank M Harding Rd.....7-1358
Roblin R O Jr Pierce Rd Rvrsde.....7-0958
Rockwell Mark E 59 Lockwood Av.....7-0010
Rocky Point Beach Club Rocky Point Rd.....7-1989
Rodger John G 8 Hassake Rd.....7-0369
Roepke R R Potters Dr.....7-0369
Rohers A Frank 23 Mianus Vllge Rvrsde.....7-2765
Rogers L T Dr vet hosp Post Rd....Stamford-3-3859
Rogers Robert E Miller La Rvrsde.....7-2613
Rohs J F Linwood Av Rvrsde.....7-1688
Roina Dominic A 23 Sound Bch Av.....7-0973
Roos Dorothy Mrs Oval Av Rvrsde.....7-1691
Roos Harry 1 Lisso Av.....7-0261
Roper Edward H 33 Terrace Av Rvrsde.....7-0060
Roper J C Dr Indian Head Pt Rd Rvrsde.....7-0156
Rosch M W 22 Stuart Dr.....7-2308
Rose Howard G 45 Arcadia Rd.....7-1030
Ross De Haven Terrace Av Rvrsde.....7-1212
Ross E C Mrs 15 Lincoln Av.....7-0246
Ross Edward J Riverside Av Rvrsde.....7-1868
Ross Robert 44 Summit Rd Rvrsde.....7-2505
Ross Wm E 34 Park Av.....7-0762
Rossbottom T H Riverside Av Rvrsde.....7-0454

Page from the Old Greenwich, Connecticut telephone book set by Remington Rand and using the "Dual-Rite."

ctric typewriters, there's none to compar
onomy-the typewriter that turns out more
nd with less effort. Electric ease of op
-makes typing a thrilling adventure. No
ted you are never far from dependable Rem
ies and genuine spare parts; or from a s
ns and carbon paper--all available throug
ed sales and service agents.

ctric typewriters, there's none to compar
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nd with less effort. Electric ease of op
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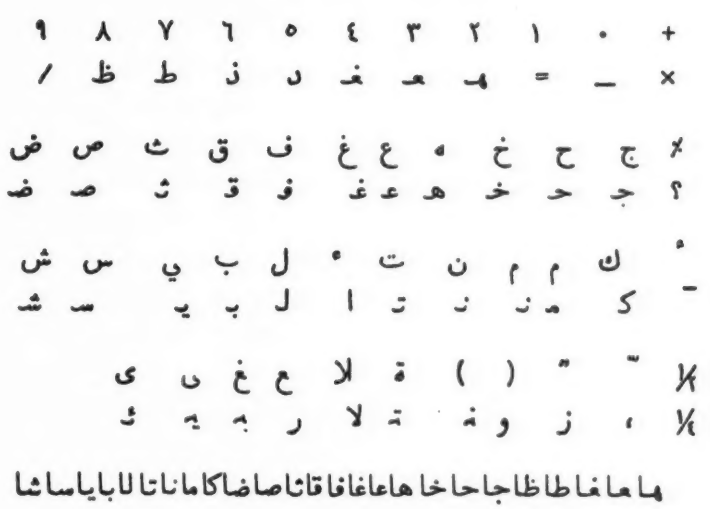
ted you are never far from dependable Rem
ies and genuine spare parts; or from a s
ns and carbon paper--all available throug
ed sales and service agents.

ABCDEFGHIJKLMNOPQRSTUVWXYZ"#$%*&'()_½¢:?.,
abcdefghijklmnopqrstuvwxyz234567890-½¢;/.,

ABCDEFGHIJKLMNOPQRSTUVWXYZ"#$%*&'()_½¢:?.,
abcdefghijklmnopqrstuvwxyz234567890-½¢;/.,

The above was typed on a Remington Electri-Conomy Machine, using Type #524, spaced 14 to the inch and using a Carbon Ribbon Bold and Light attachment.

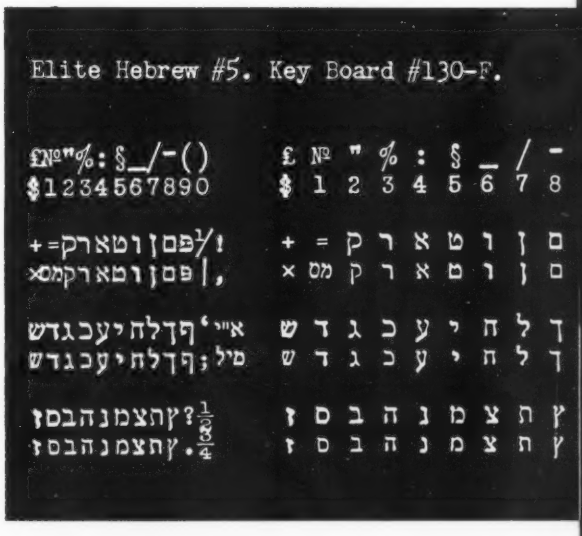
K.B.205-A. Arabic. 90 Character.



FOREIGN

All the major companies can supply type faces for those languages using the Roman alphabet. There are approximately fifty of these which include Danish, German, French, Portuguese, Serbian, Greek and others.

More difficult from a designer's point is the creation of type faces for the Eastern languages such as Arabic, Burmese, Hebrew, Siamese, Urdu and Marathi. Firstly the accepted version of writing or printing varies from district to district and this necessitates a modified design of letter or symbol that can be read and understood by all. Secondly, usually these languages require that the letters be joined to make a word understandable as contrasted to Roman letter printing where each letter stands by itself. The joining or continuous writing of these symbols or letters is a type designer's nightmare. A mechanical



aid has been the development of "dead keys" that print but do not move the carriage thus allowing a symbol to be "built up" before the carriage moves to the next letter.

Chinese, Japanese, Korean and other Far Eastern languages present more of a mechanical problem due to the greater number of characters involved than that of type design and are discussed in the adaptations section which follows.

Portable Korean Typewriter developed by Underwood in 1950

Because Korean words are in reality built-up "word pictures" some vowels are written below and some to the right of the consonqnts. The typist presses the keys of successive letters and the syllables are formed automatically without the carriage moving. As a syllable is completed the machine moves forward and is ready for the next "word picture" or syllable. Only the right hand side of the keyboard moves the carriage.

CHINESE TYPEWRITER

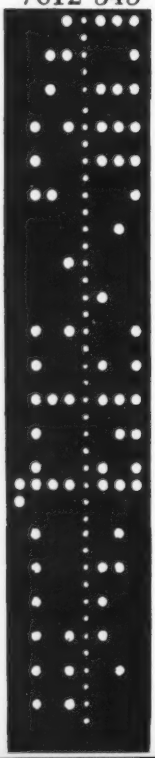
Invented by author Lin Yutang and now being further developed by Mergenthaler Linotype Company, the Minghwai Typewriter seems to come closest to solving the difficult problem of typing in Chinese.

Seven thousand whole Chinese characters are obtainable on the machine and it also will give a theoretical word total of 90,000 by combining characters. Typing vertically, a speed of 50 words per minute is possible.

To make an impression on paper the operator selects and strikes two keys that as closely as possible describe the desired character; this brings eight characters onto the small enlarging screen (at center top). From eight characters, which are numbered, the desired character is selected and a corresponding numbered key on lower part of keyboard is struck and the "word" is then imprinted as is done on an ordinary typewriter.

No further production on this or any other Chinese typewriters in existence is planned until the Far Eastern situation clarifies.

SPECIAL MACHINES



FUNCTION CODES

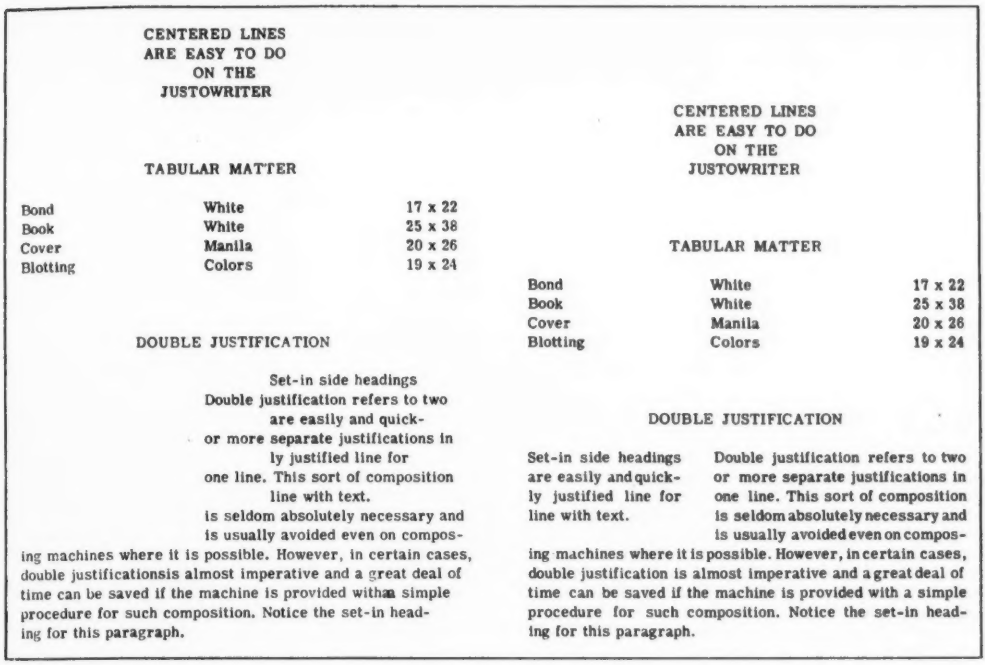
Lower Case
Upper Case
Back Space
One Unit
Three Units
Space Bar
Tab
Line Space
Code Delete
Stop Code

Line Delete

JUSTOWRITER AUTOMATIC COMPOSING MACHINE

The Justowriter consists of two units, a recorder and a reproducer. Each unit is basically an electric powered machine with a standard typewriter keyboard and the final result achieved through the type-fed reproducer is proportionately spaced right- and left-hand justified copy ready for offset camera.

As the copy is typed the recorder automatically perforates a seven hole code in a ⅞ inch wide paper tape. A light, controlled by a computer mechanism, indicates when a line is of sufficient length and has sufficient number of word spaces to permit justification. A single justification key is provided which may be pressed at any time while this light is visible and automatically the line is spaced to the proper length. At this point the tape



CENTERED LINES
ARE EASY TO DO
ON THE
JUSTOWRITER

TABULAR MATTER

Bond	White	17 x 22
Book	White	25 x 38
Cover	Manila	20 x 26
Blotting	Colors	19 x 24

DOUBLE JUSTIFICATION

Set-in side headings
Double justification refers to two
are easily and quick-
or more separate justifications in
ly justified line for
one line. This sort of composition
line with text.
is seldom absolutely necessary and
is usually avoided even on compos-
ing machines where it is possible. However, in certain cases, double justificationsis almost imperative and a great deal of time can be saved if the machine is provided withan simple procedure for such composition. Notice the set-in heading for this paragraph.

CENTERED LINES
ARE EASY TO DO
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TABULAR MATTER

Bond	White	17 x 22
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DOUBLE JUSTIFICATION

Set-in side headings are easily and quickly justified line for line with text. Double justification refers to two or more separate justifications in one line. This sort of composition is seldom absolutely necessary and is usually avoided even on composing machines where it is possible. However, in certain cases, double justification is almost imperative and a great deal of time can be saved if the machine is provided with a simple procedure for such composition. Notice the set-in heading for this paragraph.

is composed of perforations that have recorded lines of type with the interlocking and justification codes at the end of each line.

The tape is then fed to the reproducer. Through a double reader mechanism each line is always established from the tape before the automatic typing of that line is started, regardless of the variations in relative length of line. This also provides for a continuous flow of tape through the reproducer and no delay occurs when a long line follows a relatively short one.

Reasonable skill and practice on the part of a regular typist will provide copy that can go before the camera with one manual typing. Errors may be corrected by deleting one or more letters or a whole line.

The Justowriter is offered in six type faces all of approximately 12 point size. Smaller sizes are secured by photographic reduction.

As on a regular typewriter only one type face is fitted to a machine. The tape-fed reproducer will set and justify to a 54 pica measure and about 100 words a minute. Using five-letter words as an average, this equals 15,000 ems per hour.

FLEXOWRITER

Similar to the Justowriter in its use of a recorder and reproducer, it has the same choice of type faces but its function is designed for speed in repetitive typing of letters. It allows the typing in of individual addresses and salutation and then automatically types letter previously recorded on tape. Can also be used to make Addressograph plates automatically.

TELEPROMPTER

With air and rehearsal time for a normal half hour network television show running in excess of $25,000 some means had to be found to ensure that the sponsor's "words of wisdom" are given to the public just as they are written. Actors, being human, can also fluff lines and this can be costly.

Teleprompter, the newest use of the typewriter in our newest industry is really insurance against "dead air." Even used by the past masters of "the relaxed pitch" such as Como, Godfrey and Kate Smith, Teleprompter could also be called an "ulcer avoider" for harried account executives.

It is basically a prompting device that utilizes a specially designed VIDEO type face on a 29 character electric typewriter. Four television or movie scripts are typed on a 17¾ inch wide perforated continuous roll of paper. The special yellow paper which comes in quadruplicate with continuous roll one-time carbons was developed for maximum readability at 20 feet although many TV stars find it readable at 30 to 35 feet.

Each of these identical scripts is mounted on a remote controlled, electronically synchronized machine that is operated from a fixed master control unit. Three of the ma-

A B C D E F G H I J K L M N

chines can be moved at will to follow the action and dialogue on a set.

The units are powered by a motor which synchronizes the rollers that move the script and each machine has pointers that mark the exact line of the script. Thus an actor can refer to any of the four machines and be sure of his line.

Teleprompter is leased at $30 an hour. This includes an operator and supervisor, four machines and typing the script. A half hour of programming usually requires 5½ to 6 hours of rehearsal, $180 in Teleprompter rental.

This same halt hour script will require 200 feet of paper on each of the cueing machines.

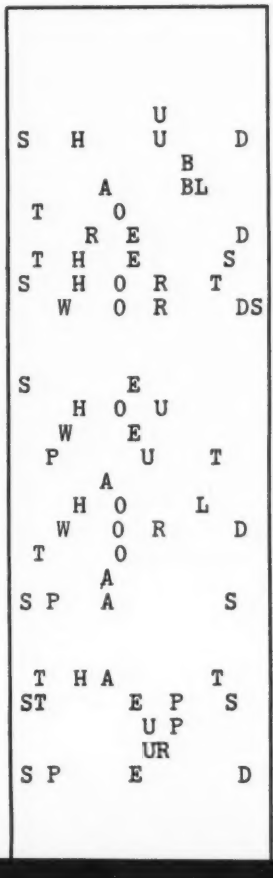
THE STENOTYPE

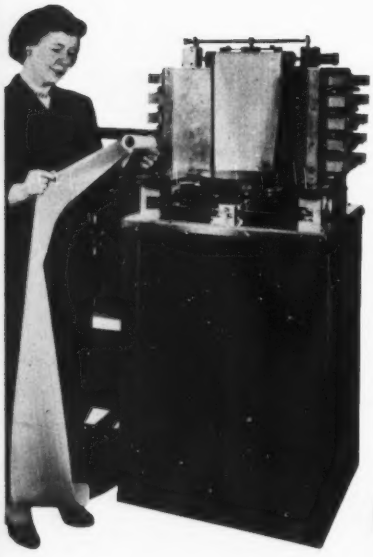
The Stenotype is a noiseless continuous paper strip shorthand machine utilizing only 23 keys. These keys may be struck singly, in groups or simultaneously. The machine records dictation phonetically and a skilled operator has taken up to 382 words a minute. (This speaking speed was achieved by a specially trained talker.)

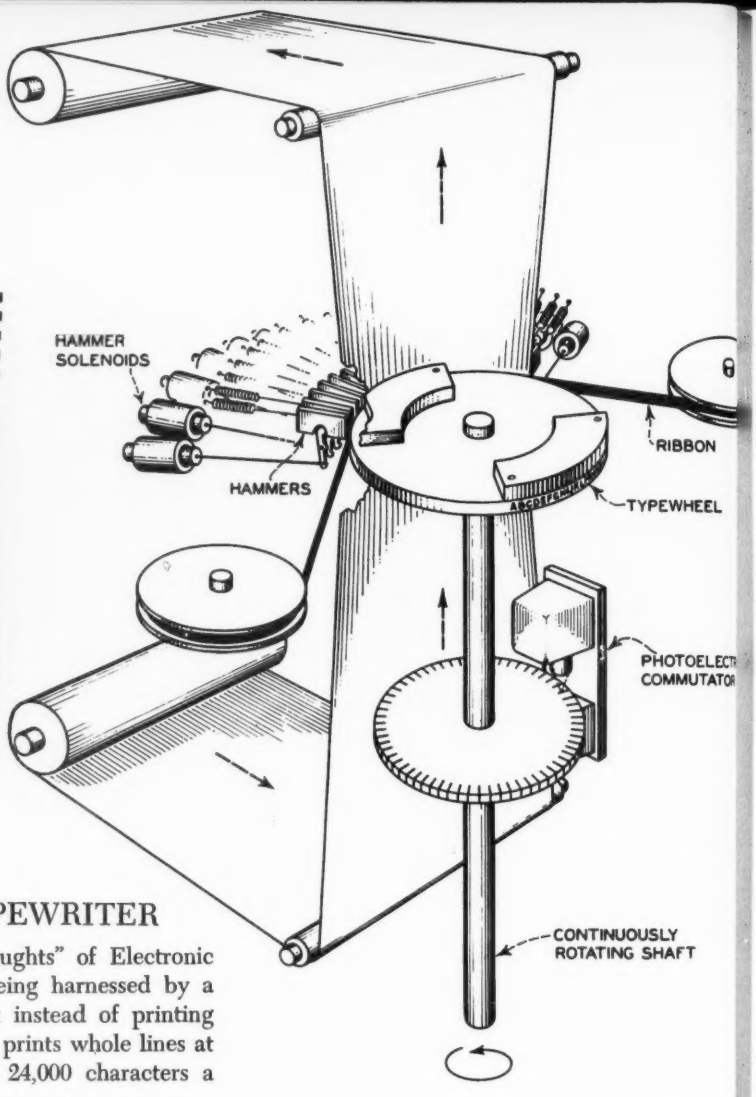
Two hundred words a minute is a more normal speed and one obvious advantage of Stenotype is that the tape can be read by anyone.

First invented by a court reporter, Ward Stone Ireland in 1913, the machine is still principally used for court work and recording conferences.

(Right) You can read these Stenotype notes. Read straight across — pronounce by sound only. Notice how all silent letters are omitted? The word "real," for instance, is written R E L, because the "a" in real is not sounded.







FLYING TYPEWRITER

The high speed "thoughts" of Electronic Calculators are now being harnessed by a "flying typewriter" that instead of printing one character at a time prints whole lines at a rate of 300 lines or 24,000 characters a minute.

Heart of the machine is a continually spinning disk with letters and numbers on its rim. Electronically, the machine converts information coded on a magnetic tape into groups of characters, 80 to a line. As the type disk revolves, 80 electronically operated hammers tap the back of the paper against an inked ribbon and onto the paper in their proper electronically selected sequence.

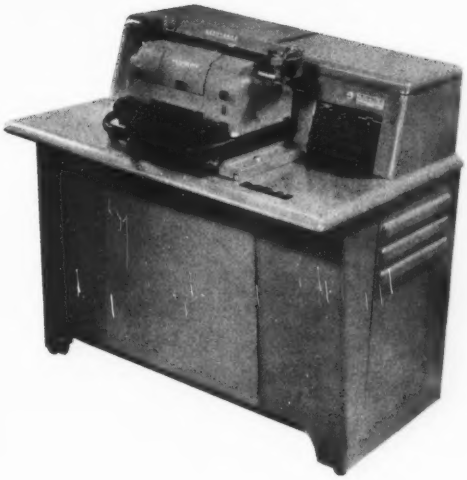
The machine is produced by the Potter Instrument Company of Great Neck, Long Island.

AUTO-TYPIST

What happened to the old "player-piano" and its paper rolls of Sousa's "Stars and Stripes Forever" march? At least the paper rolls are back in use — this time big business is utilizing the principle to personalize its form letters.

In the early '30's M. Schulz Company, makers of the Werner Player Piano, could see the end of their player-piano business that had been in existence for nearly 40 years. Radio and the movies had done their job on the old parlor stand-by. The alert young sons of the founder, Otto and Bill Schulz began casting around for other applications of the pneumatic principle employed in the player-piano. Out of their research grew the "Auto-Typist."

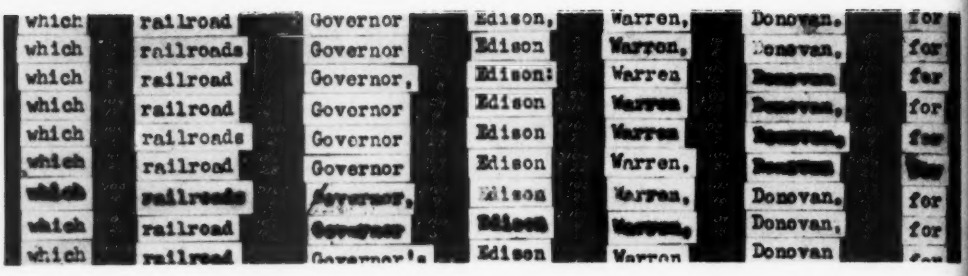
The machine is used for the automatic typing of previously recorded form paragraphs in any sequence. It allows an operator to type in the name, address and by pushing numbered buttons select paragraphs that are automatically typed. The machines are extensively used for credit collection, publishers' subscription and renewal correspondence and many other business uses where repetitive and selective typing output is a problem.



ELLIOT-FISHER ELECTRIC BOOKKEEPING AND LETTERING MACHINE

This machine utilizes a principle as old as the typewriter itself — that of the book typewriter. Originally used to permanently record deeds and wills in the record books as was then required by law (1895), the machine was unique in its use of the flat platen principle and a moveable head that printed downwards.

Latest development of this old principle is the lettering machine now used by engineers for printing specification copy on the originals for blue prints, as an improvement over hand-lettering.



which	railroad	Governor	Edison,	Warren,	Donovan.	for
which	railroads	Governor	Edison	Warren,	Donovan.	for
which	railroad	Governor,	Edison:	Warren	Donovan	for
which	railroad	Governor	Edison	Warren	Donovan,	for
which	railroads	Governor	Edison	Warren	[illegible]	for
which	railroad	Governor	Edison	Warren,	[illegible]	for
which	railroads	Governor,	Edison	Warren,	Donovan.	for
which	railroad	Governor	Edison	Warren,	Donovan,	for
which	railroad	Governor's	Edison	Warren	Donovan	for

An election can start the "poison pen letters" flowing. Here Mr. Haring, by careful documentation, proves that all of the letters received by certain New Jersey newspapers during an election campaign were typed on the same machine. The search for the typewriter narrowed itself down to a certain City Hall, but the machine itself has never been found.

TYPEWRITER DETECTIVE

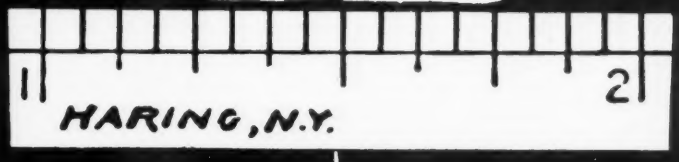
The Scotsboro Case, Fred Rose, the Canadian Atomic Bomb Spy, Bruno Richard Hauptman and Charles Lindbergh, Henry Ford and Harry Ferguson, Alger Hiss and Whitaker Chambers, Konrad Bercovici and Charles Chaplin, The Trenton Six Murder Trial. All of these are famous court cases that have made the headlines over the years.

Sitting in a quiet, carpeted office in New York's Park Row is a grey-haired sprightly man who played a major part in each of them - not as a judge, juror or lawyer - but as an expert in either typewriting or handwriting. Never taking sides or pleading a case, J. Howard Haring, with the careful and cautious approach of the scientist, has given his opinion of what he, as the expert, saw through his microscope and in the huge photo enlargements that are part of his means of seeking the truth.

Often refuting what would seem obvious to the layman, this 56 year old one time associate of Thomas A. Edison, has played an important role as the expert in hundreds of cases. War time service in this country with the Office of Strategic Services and the Armed Forces have helped round out the experience of mild mannered J. Howard Haring - "Examiner of Disputed Documents".

Proving that a disputed document was typed on a particular machine, Mr. Haring clipped identical words from many different documents known to have been typed on the machine in question (right column - Standards). Matching them against the question (left column) words he was able to prove that the document in dispute was typed on the same machine as the "Standards".

QUESTIONED (PL. EXH. 172)		STANDARDS (DEF. EXH. MM)	
1, L. 6	evil	evil	P. 8, 26, L. 4
1, L. 9	strength	strength	P. 6, 16, L
2, L. 4	into	into	P. 14, 43, L. 7
1, L. 8	magic	magic	P. 8, 24, L. 4
2, L. 3	which	which	P. 8, 24, L. 3
2, L. 13	make	makes	P. 11, L. 4
3, L. 10	about	about	P. 13, 39, L. 4
7, L. 10	from	from	P. 20, 72, L. 2
3, L. 1	SEA	HEAD.	P. 6, 15, L. 1
2, L. 1	12	12:	P. 4, 12, L. 1
2, L. 2	30	30:	P. 9, 30, L. 1



A Review of

NEAR - PRINT COMPOSITION

by Rolland Jenkins

Over five hundred years have elapsed since the invention of printing from movable type. It is noteworthy that, unlike almost every other important invention, there was no change for nearly 450 years in the basic principle. Individual pieces of type that had been individually cast, were picked by hand out of boxes, set in lines, justified, made up in a form, used on a press, and redistributed by hand.

The introduction of machine setting some sixty-five years ago, and subsequent developments, eliminated the laborious hand-setting, and enormously simplified type composition. As a result the cost of printing was at a relatively low level for a long period. However, the past two decades have brought about such heavy increases in the cost of conventional printing methods that publishers must now exercise the greatest caution in the selection of material for publication. This is especially true in connection with scientific and technical works, where sales are limited to relatively small groups of students and scholars. The nature of the subjects requires much hand set material, such as mathematical equations, formulae, and tabular matter, and this results in heavy costs for composition.

The inevitable result of high costs is a continuing effort to develop alternatives that are reasonably satisfactory. Some instances are known where the subsitute method has eventually proven to have important advantages over the former method. One of these alternatives that is rapidly gaining ground is often called "near-print".

WHAT IS NEAR - PRINT?

The 1951 issue of "Penrose Annual", published in England, had this to say in its review of various phases of typography:

"Near-print is a new expression which covers photographic and typewriter type composition. These two alternatives to the use of metal type, whether machine or hand set, are attracting increasing attention from publishers, large print users and printers, so that an examination of the causes of this interest appears to be necessary. If these processes are proved to be commercially sound there may be more rapid development than hitherto visualized."

In the United States the wide interest in near-print* has led to extensive experimentation and development looking toward the production of devices of reasonable versatility that will at the same time bypass the customary processes which are so costly that they sometimes limit or completely prohibit the publication of many useful articles, books, and other information that deserves wide dissemination in its specific field. Some of the new devices go beyond machine setting and eliminate the use of movable type altogether.

The three groups most concerned - printers, publishers, and large users of printed matter - will seek the answers to a wide range of questions. The printer will ask: How will near-print equipment benefit me economically? Will the results be acceptable to my customers? The publisher will want to know: Can I get good book work at lower cost? Can I adapt near-print to the production of books which, because of complex composition, are exceedingly expensive? How speedy is near-print composition? Can corrections be dealt with more efficiently than at present? The large user of printed products, whose chief concern is cost, speed, and flexibility, will ask: Is near-print advantageous for mail order catalogues, internal reports, periodical bulletins, office forms, and the many other forms of routine printing?

Inasmuch as many of these questions concern all three groups, and thereby overlap, they can best be discussed in a general way. This issue of PRINT serves as a demonstration of the use of "Near-print" as further explained in Production Notes.

Perhaps the best approach is to consider the subject in its simpler aspects and proceed step by step to the more highly developed stages of near-print techniques.

* Near-print is one of several names for the methods of composition other than hand-set or machine cast. "Nomic printing" meaning - no metal in composition - is perhaps more accurate.

HOW GOOD IS NEAR - PRINT?

One of the most eminent of modern typographers, Stanley Morison of Great Britain, has said: "The typography of books, apart from the category of narrowly limited editions, requires an obedience to convention which is almost absolute." Publishers as a group have been notoriously conservative, regarding traditional forms and processes. If such a static condition had prevailed in other forms of communication we would be living in a very strange world as compared with our fantastic accomplishments in fields such as transportation, radio, television, and other aspects of our daily life.

Reproduction of typewritten copy is not new. For a half century or more standard typewriters have been used to prepare copy for reproduction on duplicating machines or offset presses. It is only within the past ten years, however, that typewriters have been developed which provide a reasonable resemblance to conventional type faces.

At present most near-print production is composed on two different machines that are basically typewriters - the International Business Machines Proportional Spacing Typewriter, and the Varityper DSJ Composing Machine. (Like the trade name "Frigidaire", which is loosely applied to all makes of refrigerators, the term "Varitype" is sometimes erroneously used to designate all composition done with typewriters.)

Considering the various machines in the order of relative cost and complexity, the IBM Proportional Spacing Typewriter is reasonably priced, and many users like its speed and ease of operation. An initial expenditure of about $600, plus a good operator, will enable one to produce excellent copy for offset reproduction, at a rapid rate. A good operator is mentioned at this point because a certain knack is needed to obtain satisfactory results. It is not reasonable to expect that every competent typist can be converted to a good near-print compositor. Basic training as a typist is of course essential, but in addition a flawless technique and a typographic sense are needed. Most typists work from written or dictated copy, and type with the left margin as a reference point. Near-print composition is usually arranged with optical center in mind, and the operator works from manuscript copy

containing editorial marks and directions that are not always understood by a typist without special instruction.

The IBM machines are obtainable in any one of several type faces, some of which are eminently suitable for offset reproduction. The 11 and 12 point sizes retain their easy readability when reduced by one-half or more.

The Varitype DSJ Composing Machine is much more costly than the IBM. With a wide selection of type plates, it sells at about $2,000. The outstanding advantage of this machine is its suitability for copy with a large variety of type faces and sizes, and a number of letter and line spacings.

Both of these machines will provide justified right margins with two transcriptions. However, unjustified right margins are readily acceptable for some types of work. In many fields people are today becoming conditioned to utility where mere appearance is costly, and so long as the result is functionally satisfactory there is little objection to unjustified copy. It may be noted that there is a strong trend towards unjustified lines in advertising.

One other presently available composing device that makes use of basic typewriters is the Justowriter, a dual-unit machine that shows great possibilities for lengthy text or book work. The Justowriter costs about $5,000, but as additional recorder units may be obtained separately, several machines can perform the first operation for transcription on the second unit. The possibilities of large output are obvious.

Passing on to composing machines still in development or in limited production, there are several that will undoubtedly serve the ultimate objective of near-print composition, i.e., economy of operation, and speed. These are not designed on the basic typewriter principle, but make use of photographic and/or electronic methods of reproduction. Those that have received the widest attention up to this time are the Higonnet-Moyroud Photographic Type Composing Machine, and the Intertype Fotosetter. Other important typographic concerns are understood to be working on composing machines that will probably have many features in common with those already mentioned.

NNNNNNNNNNNNNNNN

THE VERSATILITY OF NEAR - PRINT?

Coming now to the types of work that may be produced on the various types of machines in general use, and the cost as realted to conventional printing methods, the following will serve to show that near-print composition has passed beyond the point of mere improvisation and compares favorably with fully typeset copy. A great variety of useful type faces are available and are adapted to either enlargement or reproduction. Close scrutiny would be needed to differentiate these faces from typeset samples.

Substantial savings are possible in setting tabular matter such as statements or budgets. Near-print composition of this character can be done for less than one-half the cost of linotype.

Mathematical material can be composed with near-print at one-fourth the cost of typesetting. Here near-print departs somewhat from the traditional appearance of mathematical matter, but as mathematical texts are among the most costly to compose, pbulishers are beginning to adapt near-print to scientific and technical books to avoid the necessity of pricing the book so high that sales would be seriously limited. Some objection has been voiced to the variation from the of utility versus high costs must in many cases influence the decision whether or not to publish. It is not to be supposed that most scientists are so thoroughly committed to tradition that they will not accept expedients when the alternative method so nearly approaches the customary treatment, and in some instances is more legible.

Although much less latitude is possible with near-print than with typesetting, one can intermix types to a limited extent by the use of two or more Justowriter or IBM machines, or by interchanging type fonts on the Varityper. In addition, typeset chapter heads, running and side heads will break up the monotony and improve the appearance. When we consider that a vast majority of books printed today are set from only about a half dozen of the several hundred obtainable type faces, it is not difficult to discount the objections to near-print because of the relatively limited variety of faces obtainable for this method of composition. There are bound to be continuing improvements in

the present machines, and such new devices as the Intertype Fotosetter, which will soon be available in a desk model for limited production, will make it possible to compose copy from many series of types, and point sizes from 6 to 36 may be selected at the turn of a dial. This machine will also provide improved methods of setting which are not possible with linecasting or most hand set type, such as the treatment of kerned characters, for better appearance.

Coming now to the important matter of comparative costs, it is self evident that much depends on the type of text involved, that is whether it is a straight composition or generally technical in character, with mathematical characters and equations; whether there are many foot notes, captions, runarounds, and other complexities.

Fortunately studies have been made, based on both straight and mathematical composition. These studies have been serious attempts to obtain objective comparisons without accepting some of the unfounded claims of the advocates of new methods. One such analysis by Herbert S. Bailey, Jr., of the Princeton University Press, was printed in "Publishers' Weekly", July 1, 1950. Although the cost figures shown therein have probably advanced since that time, the comparisons are undoubtedly valid percentagewise.

Using as a basis of comparison a book of 160 pages, set by linotype and printed by letterpress, the following figures are cited:

	Composition and make-up	Printing	Paper	Total
Linotype and letterpress	$ 600	$ 320	$ 85	$ 1005
IBM proportional (unjustified)	240	360	85	685
IBM proportional (justified)	400	360	85	845
Monotype and letterpress (160 p.)	1760	320	85	2165
Near-print (190 p.)	380	420	100	900

The first three lines represent the figures for a manuscript of about 300 typed pages of straight composition, which would make up into a

6 by 9 inch book, set in 10/12 type, 27 by 42 picas, 1,000 copies. The last two lines refer to a mathematical manuscript, which might cost $11 per page, and the same copy prepared on an electromatic typewriter, which would probably increase the page count to 190.

This comparison shows that in straight composition there is an appreciable saving in the use of near-print, especially if unjustified copy is acceptable. But the figures emphasize the great advantage of near-print in technical composition when costs are a vital factor.

The possible economies of near-print do not end there, however. When the books are set by linotype, important savings are possible by using near-print composition for copy containing a great deal of tabular matter. If this is embodied in the text it can be composed on the proportional spacer and made into a line plate for insertion at the proper place. If the material is supplementary, such as appendices, bibliographies, tables and formulae, or indices, the cost of composition will be substantially reduced.

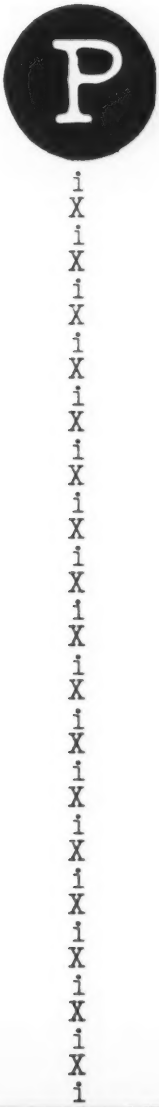
Other considerable items such as the preparation of illustrative material, such as diagrams, charts and graphs, can be made up in a very acceptable manner, Ordinarily this work is assigned to a draftsman, who draws and handletters the illustration. Handlettering is quite expensive. Typed legends may be easily incorporated, the appearance equals typeset matter, and is a decided improvement over much handlettering. The relative costs are in favor of the typewritten charts.

Both major and minor corrections of near-print copy are made with ease and speed. A misspelled word can be "Whited out" and typed over at once. More extensive corrections, such as lines, sentences, or paragraphs are generally retyped and pasted in place without disturbing preceding or following copy. There are other time and money saving elements in near-print composition, such as the elimination of storage expense for critical metals, if reprints are anticipated, but these will become apparent as comparative analyses of individual cases are made.

THE IMMEDIATE FUTURE

To sum up the main advantages of near-print as they appear today, it is certain that because of economy and speed of production, the use

of this process will expand very rapidly in the production of scientific and technical works. There are in development many improvements in the mechanics and appearance of the product of presently available machines, and new devices will add versatility. For the perfectionist and the esthete the photographic composition of the Fotosetter leaves little or nothing to be desired. It must be said, however, that the standard Fotosetter does not yet offer any economy in composition costs, but the less complex and comparatively inexpensive machines are steadily demonstrating that work of fine quality is rapidly becoming attainable.



GLOSSARY OF TERMS AS APPLIED TO TYPEWRITER TYPES

D.c. — Double case, or capitals and small letters

Elite — A 10 point typewriter type having a spacing of 12 standard or 10 special letters per inch

Font — An assortment of type of one size and style

Gothic — In England — Black letter. In America — A square-cut type with no serifs

Indenting — See *Perforating*

Lower case — Small letters. Letters which are not capitals

Normal spacing — One set width for all characters. Not proportional spacing

Perforating — Making rows or lines of small holes pierced through the paper

Pitch — Denotes width of characters. Number of characters to the inch in typing

Pica — A typewriter type size, 10 pitch, or 10 characters to the inch

Point — 1/12 of a pica or .013837 inch or nearly 1/72 inch

Proportional spacing — Characters given several widths to fit individual needs as opposed to regular spacing

Ratchet — Number of teeth on roll which governs the vertical spacing of the lines

S.c. — Single case, or all capitals

Shiftless alphabet — One character to a key. No shift for upper and lower case

Tooth or Teeth — On ratchet of impression roll to govern line spacing

Upper case — Capitals

BIBLIOGRAPHY OF TYPEWRITERS

I. BOOKS AND PAMPHLETS

Friesison, Henry Cecil. *Text Book on Typewriter Repairing.* Boston: Thorp and Martin Company, 1912.

Herkimer County Historical Society. *The story of the Typewriter, 1873-1923.* Herkimer, New York: Press of A. H. Kellogg Company, 1923.

McCarthy, James Henry. *The American Digest of Business Machines.* Chicago: American Exchange Service, 1924.

Nicholson, R. T. *Mechanical Devices of the Typewriter.* New York: Sir Pitman and Sons, Ltd., 1920.

Royal Typewriter Company, Incorporated. *The Evolution of the Typewriter.* New York: Royal Typewriter Company, Incorporated, 1921.

Waters, Campbell Easter. *Typewriter Ribbons and Carbon Paper.* Washington: United States Government Printing Office, 1941.

Wood, Benjamin De Kalbe. *An Experimental Study of the Educational Influences of the Typewriter in the Elementary School.* New York: Macmillan, 1932.

Zellers, John Adam. *The Typewriter.* New York: Newcomen Society of England, American Branch, 1948.

II. MAGAZINE ARTICLES

"Air-Operated Automatic Typewriter," *Compressed Air Magazine,* July-September, 1950, pages 187-188.

Chase, H. "Duplex Setup Solders Type to Typewriter Bars," *Steel,* June 18, 1951, page 76.

"Design with a Point; Italy's Olivetti," *Fortune,* June, 1951, pages 112-117.

"Differential Spacing of Characters Featured in New Vari-Type Machine," *Inland Printer,* August, 1948, page 44.

Galpin, S. K. "Electric Hunt and Peck," *Management Review,* August, 1950, page 449.

Griffith, R. T. "Minimotion Typewriter Keyboard," *Journal of the Franklin Institute,* November, 1949, pages 399-436.

Keelan, C. I. "Manual vs. Electric Typing; Abstract," *Management Review,* July, 1951, pages 402-403.

Kremer, J. "Milestones in Design," *Machine Design,* November, 1950, pages 154-157.

Mathers, K. H. "Six Ways to Type Copy for Duplicating, Making Right Hand Margins Even," *Printers Ink,* February 6, 1948, pages 38-39.

"New Typing Reel Aligns Margin Automatically," *Editor and Publisher,* June 19, 1948.

Norris, W. "Electric Typewriters, Pro and Con," *American Business,* April, 1950, pages 10-11.

"Punched Rolls Actuate Letter Writer," *Machine Design,* October, 1950, page 119.

Remington Rand. "Design for Quick-Get-at-Ability," *Modern Industry,* July, 1950, pages 38-41.

Scott, R. B. "Time Saving Typewriters," *Science Digest,* September, 1951, pages 27-30.

"Three View Screen Aligns Type Faces," *Product Engineering,* January, 1951, page 116.

A SHOWING OF TYPEWRITER FACES

A selection of Remington and I. B. M. faces representative of the wide variety of faces available for many uses is shown on pages 58-63 which follow. A similar range of type styles is available from the other major companies as indicated in the list of faces appearing on pages 64-68.

As our concern here is with the faces and sizes available, we have not gone into the matter of whether they are available on office, portable or electric machines. We have also simplified the lists by eliminating duplications as far as possible where more than one face is available in combination on the same machine.

Although we find the nomenclature rather confused, we have attempted an alphabetical listing. Some companies prefer listing by their own serial numbers and others use a breakdown by type sizes.

One company has this to say: "In the case of typewriter types, generally speaking we refer to Pica as 10 Pitch, or 10 characters to the inch. Elite is normally 12 Pitch, or 12 characters to the inch. We do make what we call 10 Pitch Elite which is actually Elite type on a Pica or 10 Pitch body. (This is just to make it real confusing)". The fact that Pica in printing terminology means 12 point rather than 10 Pitch doesn't help any.

Perhaps this listing will point to an opportunity for standardization, a uniform system of describing and identifying faces in this field where names are as complex as those of pedigreed cows, and perhaps less meaningful.

Type Style & Number	Pitch		Vert. Spcg
Microtype 57	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6
Multigraph Elite 145	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6
Multigraph Pica 37	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and key-boards to meet all writing requirement	6
Large Pica 10 or 510	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and key-boards to meet all writing requirement	6
Medium Roman 12 or 512	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and key-boards to meet all writing requirement	5.4
Medium Roman 12 or 512	9⅓	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requir	5.4
Primer 44 or 544	9⅓	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requir	5.4
Large Primer 47 or 547	8	REMINGTON TYPEWRITERS are avail able in a wide range of type styles and keyboards to meet al	5
Magnatype 105 (Wide Motion)	6	REMINGTON TYPEWRITERS are available in a wide	3
Roman Bold 103	9⅓	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requir	6
Roman Bold 103	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and key-boards to meet all writing requirement	6
Small Bulletin 96	8	REMINGTON TYPEWRITERS are avail-able in a wide range of type styles and keyboards to meet all	4.1

Type Style & Number	Pitch		Vert. Spcg.
Large Bulletin 48 (Wide Motion)	6	REMINGTON TYPEWRITERS are available in a wide	3
Miniature Gothic 58	16	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. all Remington type is designed, as well as spaced upon the written	8
Micro-Gothic 502	16	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. ALL REMINGTON TYPE IS DESIGNED, AS WELL AS SPACED UPON THE WRITTEN	8
Minuscule Gothic 108	14	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIGNED, AS WELL AS SPACED	8
Minuscule Gothic 108	12	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIG	8
Art Gothic 69 or 569	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement	6
Art Gothic 69 or 569	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6
Modern Double Gothic 7 or 507	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENT	5.4
Small Bookman 232	12	**REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig**	6
Bookman Print 230	10	**REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement**	5.4
Executype (Large) 505	10	**REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement**	6
Executype (Small) 516	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6

Type Style & Number	Pitch		Vert. Spcg.
Executype 516	10	**REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all typing requirement**	6
Remington Rand (Large) 100 or 500	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement	6
Remington Rand (Large) 100 or 500	9⅓	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requir	6
Remington Rand (Small) 560	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6
Remington Rand (Small) 560	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement	6
Elite 4 or 504	12	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. Remington Type is desig	6
Elite 4 or 504	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement	6
Pica 134 or 534	10	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement	6
Italic 41 or 541	10	*REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirement*	6
Sans Serif Gothic 266	16	REMINGTON TYPEWRITERS are available in a wide range of type styles and keyboards to meet all writing requirements. All Remington type is designed, as well as spaced upon the writ	8.2
Small Modern Double Gothic 280	12	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIG	6
Small Modern Double Gothic 280	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENT	6

Type Style & Number	Pitch		Vert. Spcg.
Modern Double Gothic 207	10	REMINGTON·TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEY-BOARDS TO MEET ALL WRITING REQUIREMENT	5.2
Gothic Billing 289	10	ALPHABET KEYS HAVE FRACTIONS OR OTHER SYMBOLS IN THE UPPER CASE OVER GOTHIC CAPITAL LETTERS IN THE LOWER CASE.	6
Gothic (Upper) Indenting (Lower) 291	10	GOTHIC TYPE IN UPPER CASE FOR BILLING PURPOSES COMBINED WITH INDENTING TYPE IN LOWER CASE FOR PROTECTIVE WRITING	6
Standard Double Gothic Billing 89A or 589A	10	ALPHABET KEYS HAVE FRACTIONS OR OTHER SYMBOLS IN THE UPPER CASE OVER GOTHIC CAPITAL LETTERS IN THE LOWER CASE.	6
Small Modern Billing Gothic 52 or 552	10	ALPHABET KEYS HAVE FRACTIONS OR OTHER SYMBOLS IN THE UPPER CASE OVER GOTHIC CAPITAL LETTERS IN THE LOWER CASE.	6
Extra Large Gothic Billing 72 or 572	9⅓	THE ALPHABET KEYS HAVE FRACTIONS OR OTHER SYMBOLS IN THE UPPER CASE OVER GOTHIC CAPITAL LETTERS IN LOWER CASE	5.4
Modern Double Gothic 7 or 507	9⅓	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIR	5.4
Standard Double Gothic 89 or 589	12	REMINGTON TYPEWITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEY-BOARDS TO MEET ALL WRITING REQUIREMENT	6
Standard Double Gothic 89 or 589	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIG	6
Duplicate Gothic Capitals 89B or 589B	10	THE ALPHABET CONSISTS OF THIS SIZE OF GOTHIC CAPITAL LETTERS DUPLICATED IN BOTH UPPER AND LOWER CASE POSITIONS.	6
Small Indenting 9 or 509	10	INDENTING TYPE FOR CHECK WRITING MAKES FRAUDLUENT ALTERATION ABSOLUTELY IM-POSSIBLE. FIFTY DOLLARS-*****$50.00*	6
Large Indenting 15 or 515	8	INDENTING TYPE FOR CHECK WRIT-ING MAKES FRAUDULENT ALTERATION ABSOLUTELY IMPOSSIBLE-***$50.00*	4.1

Type Style & Number	Pitch		Vert. Spcg.
Indenting (Upper Case) and Gothic 90 or 590	10	INDENTING TYPE IN UPPER CASE FOR PROTECTIVE WRITING COMBINED WITH GOTHIC TYPE IN LOWER CASE FOR BILLING PURPOSES	6
Indenting (Lower Case) and Gothic 91 or 591	10	GOTHIC TYPE IN UPPER CASE FOR BILLING PURPOSES COMBINED WITH INDENTING TYPE IN LOWER CASE FOR PROTECTIVE WRITING.	6
Indenting (Lower Case) and Extra Large Gothic 93 or 593	8	GOTHIC TYPE IN UPPER CASE COMBINED WITH INDENTING IN LOWER CASE FOR PROTECTIVE WRITING.	6
Standard Gothic 62	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENT	6
Standard Gothic 62	12	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIG	6
Modern Gothic Large Caps 14	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENT	5.4
Modern Gothic Large Caps 14	9⅓	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIR	5.4
Extra Large Gothic 75	8	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL	4.1
Indenting 25	10	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENT	6
Elite Capitals 22	12	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS. REMINGTON TYPE IS DESIG	6
Bulletin 38	6	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE	3
Large Bulletin 39	6	REMINGTON TYPEWRITERS ARE AVAILABLE IN A WIDE	3

Type Style & Number	Pitch		Vert. Spcg.
Large Pica	10	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements	6
Secretarial	11	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.	5-1/4
Cloister Elite	12	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.	6
Charter	15	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.	6
Bold Face	**11**	**IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.**	**5 1/4**
Bold Face No. 2	12	**IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.**	5 1/4
Modern	11	**IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.**	5 1/4
Federal Slant	6 2/5	*IBM ELECTRIC TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRI*	6
Elite Wedding Gothic	6 2/5	IBM ELECTRIC TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRI	6
COPPER PLATE GOTHIC	12	**IBM ELECTRIC TYPEWRITERS ARE AVAILABLE IN A WIDE RANGE OF TYPE STYLES AND KEYBOARDS TO MEET ALL WRITING REQUIREMENTS.**	**5 1/4**
Text	15	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.	6
Documentary	11	IBM Electric Typewriters are available in a wide range of type styles and keyboards to meet all writing requirements.	5 1/4

REMINGTON RAND, INC.

315 Fourth Avenue, New York 10

Name	*Pitch*
Bold, Roman	9⅓, 10
Bookman, Print	10
" Small	12
Bulletin	6
" Large	6
" Small	6
Elite	10, 12
" Capitals	10, 12
Gothic	10
" Art	12
" Billing	10
" Capitals, Duplicate	10
" Extra Large	8
" " " Billing	9⅓
" Miniature	16
" Miniscule	12, 14
" Modern	10
" " Large Caps	9⅓, 10
" " Small Caps	10
" " Double	9⅓, 10
" " " Small	10, 12

Name	*Pitch*
Gothic, Sans Serif	16
" Small Modern Billing	10
" Standard	10, 12
" " Double	10, 12
" " " Billing	10
Indenting	10
" Large	8
" Small	10
Magnatype	6
Microtype	12
" Small Elite	12
Micro-Gothic	16
Minuscule, Large Caps	12, 14
" Small Caps	12, 14
Multigraph	10,12
Pica	10
Primer	9⅓
" Large	8
Remington Rand	10
Roman, Medium	8, 9⅓

INTERNATIONAL BUSINESS MACHINES CORPORATION

590 Madison Avenue, New York 22

Name	*Pitch*
Book, Pica	9
" " Large	9
" Roman	10
Bookface, Academic	10
" Large	9
Elite	12
" Backslant	12
" Cloister	12
" Large	12
" Micro	14
" Multigraph	12
Executive, Bold Face	1/32"
" " " No. 2	1/36"
" Charter	1/45"
" Copperplate Gothic	1/36"
" Documentary	1/32"
" Mid-Century	1/36"
" Modern	1/32"
" Secretarial	1/32"
" Text	1/45"
Gothic, Accounting	10
" Dual Basic	12

Name	*Pitch*
Gothic, Elite	12
" " Bold	12
" " Inverted	12
" " Wedding	6⅔
" Facsimile	6⅔
" " Inverted	6⅔
' Large Roman	8
" Medium Roman	9
" Micro	14
" " Condensed	16
" Modern	9
" Pica	10
" " Inverted	10
" Pin Point	10
" Regent	10
" Special	10
Pica	10
" Cloister	10
" Inverted	10
" Large	10
Primer, Great	9
Slant, Federal	6⅔

ROYAL TYPEWRITER COMPANY, INC.

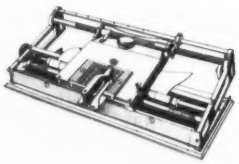
Two Park Avenue, New York 16

Name	*Pitch*
Ampli	6
Bank	20
Book	9
Bulletin	6
Butterick	8
Century	10
Elite, Century	10, 12
" Condensed Small	16
" Intermediate	10, 12

Name	*Pitch*
Gothic, Pru Elite Single	12
" Semi	10, 12
" Single	10
" Special Large	8
Monoface	10
Old English	9
Pica	10
" Intermediate	10
" Italic	10

Name	*Pitch*
" Multigraph	12
" Small	12, 16
" Standard	10, 12
Executive	9
Gothic, Bank	16
" Double	10, 12, 16
" Medium Roman	9
" Modified Elite Single	12, 14
" " Pica Double	10, 14
" Pint Point Double	10
" " " Large Double	8
" " " Medium Roman Single	9
" Pru Double Modified	10, 12

Name	*Pitch*
" Large	10
" Large Modern	6
" Modern	10
" Multigraph	10
Primer, Great	9
Roman, Medium	10
" " Italic	9
Textype, Elite	12
Vogue	10
" Intermediate	9
" Large	6
" Modified	10



UNDERWOOD CORPORATION

One Park Avenue, New York 16

Name	*Pitch*
Bulletin	6
Elite, Distinctive	10, 12
" Italic	10, 12
" Multigraph	12
" Wide	10
Gothic	10, 12
" Art Numerals	8, 10
" Check Perforating	8, 10
" Condensed	8, 16
" Extra Large	6
" Heavy Face	10, 12
" Roman Heavy Face	9, 10
" Library	9
" Large Roman	8
" Medium Roman	10
" " Check Perforating	10
" Small	16
" Wide	6

Name	*Pitch*
Italic	10
" Condensed	9
" Large	9
Microtype	12
" Condensed	16
Old English	8
Pica, Distinctive	10
" Large	10
Primer, Giant	6
" Great	8, 9
Roman, Medium	10
Script, Vertical	10
Stymie, Unit Space	10
Victoria	9
" Bank	6
" Elite	10, 12
" Small	10
" Wide	8

L. C. SMITH & CORONA TYPEWRITERS, INC.

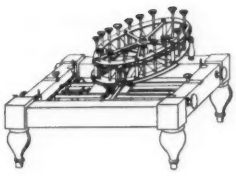
701 E. Washington Street, Syracuse 1, N. Y.

Name	*Pitch*
Basic, Writing	5
Book, Shaded	10
" " Large	9
Bulletin	5, 6
" Caslon	5, 6
" Gothic	6
" Large	5
Elite	10, 12
" Large	12
" Multigraph	12
" Special	12
" Ultra Micro	14, 10
Empire	10
Gothic	10, 12
" Large	10, 12
" Micro	14
" Radio	8
" Ultra Micro	16
Italic, Large	8
" Pica	10
Micro	12, 14
Old English	10
Pica	10
" Large	10
" Multigraph	10
" Special	10
Pin Point	10
" " Large	10
Primer, Great	8
Print	8
Roman, Medium	9, 10
Script	10
" Medium Roman	10
Sight Ease	6
" Saver	6

R. C. ALLEN BUSINESS MACHINES, INC.

461 Fourth Avenue, New York 16

Name	*Pitch*
Elite	10, 12
" Gothic	12
" Small	12
Gothic, Extra Large	8
" Medium Roman	9, 10
" Pica	10
Multigraph, Elite Linotype	12
" " Standard	12
Multigraph, Pica Linotype	10
" " Standard	10
Pica	10
Pin Point (D.C.P.P. & Pica Gothic)	8
Primer, Great	8
Roman, Medium	9, 10
Victorian	9



PAILLARD PRODUCTS, INC.

Hermes Typewriters

265 Madison Avenue, New York 16, N. Y.

Name	*Pitch*	*Name*	*Pitch*
Diamant	12½	Pica	10
Economic	17	" Large	10
Elite	12½	Roman, Medium	10
Hermes Speciale	10	" Long	18½

RALPH C. COXHEAD CORPORATION

The Vari-Type Composing Machine-DSJ.

720 Frelinghuysen Avenue, Newark 5, N. J.

Name	*Pitch*	*Name*	*Pitch*
Alexandria Light	6, 8, 10	Modern Roman	8, 10
Bell Gothic Medium	10	" Italic	10
Bodoni Book	7, 8, 10, 12	News Bold	7½, 9
" " Italic	7, 8, 10	" Gothic Condensed	10, 12
Bookman	6, 8, 10	Palm Beach	10
" Italic	6, 8, 10	Sans Serif Bold	7, 8, 10, 12
Cramer Italic	12	" " " Italic	7, 8, 10
Fractional Type	8, 10	" " Fractions	8
Garamond	7, 8, 10, 12	" " Medium	7, 8, 10, 12
" Italic	7, 8, 10	" " " Italic	7, 8, 10
" Bold	7, 8, 10, 12	" " " Condensed	8, 10
" " Italic	7, 8, 10	Tribune News	7½, 9
Mathematical Type	10		

COMMERCIAL CONTROLS CORPORATION

Justowriter

One Leighton Avenue, Rochester 2, N. Y.

Name	*Pitch*	*Name*	*Pitch*
Bold Face	12	Modern	12
Documentary	12	Rogers	12
Galvin	12	Secretarial	12

NOTES ON CONTRIBUTORS

Lawrence A. Audrain has ferreted out and arranged the surprisingly little known material for this issue. Canadian born, "Lawrie" spent three years as a reporter and photographer for the London Daily Telegraph, the Daily Express and Life (Europe). During five years in service, he organized the Canadian Army Film and Photographic Unit. Later at Supreme Headquarters, working with his American and British colleagues, he coordinated the work of some 700 newsreel and still cameramen.

After the war, Major Audrain was for a time managing editor of Illustrated Magazine, a London weekly of 1,200,000 circulation. He returned to the U. S. to direct advertising and public relations for J. Arthur Rank's Prestige Pictures. Following the international battle in the motion picture industry, Lawrie turned to the more peaceful pursuit of acting as Vice President and Resident Director for B. T. Batsford, Ltd. (The British Book Centre.)

PRINT then persuaded Lawrie to aim his talents in this direction. We think this unusual issue is a fair example of his energetic, intelligent work. Lawrie also handles public relations for the American Institute of Graphic Arts as well as serving as our advertising and circulation manager.

George A. Shealy gives the following account of himself:

"Born in Chicago, March 4, 1910. Raised from the age of six weeks in the village of Churubusco, Indiana. Spent the early formative years working in the family bakery and can still mold a good loaf by hand or run off two buns at a time. Also did the required amount of drawing on wall paper and Shredded Wheat separators.

To Chicago and the Art Institute. Drawing, Painting and Illustrating course. After three years seemed a good idea to have knowledge of type and design to fill out the lean periods. Art Institute didn't think so at that time so quit. Studied nights with John Norton, spent days in the Library. Family finally found out. Lived through required poverty.

Mural work with Norton, some on my own, free lance illustrating, advertising illustration and layout, went to Marshall Field & Company for two years.

Conde Nast Publications brought me to New York and the Army shortly sent me to Europe in the Combat Engineers. OWI took me off the coal pile and put me behind a desk art directing publications out of London.

To Street and Smith for four years art directed Charm Magazine on a month-on-month-off basis. Month off was for painting, which was sometimes possible. Last two years free lance art director and artist."

Rolland Jenkins began his varied career in the merchant marine. For twenty-eight years he served the International Mercantile Marine Company where he became Cruise Manager. After World War I his hobby of microscopy and photomicrography, became a new career in a firm dealing with laboratory equipment. The second World War brought a change to the field of engineering science and management, which he studied at Princeton, followed by work with a firm in Brooklyn. In 1945 ill health forced him to take life more easily as one of the editorial staff at Prentice-Hall. When this, too, proved too

strenuous in 1951, he began experimenting with typesetting on IBM and Vari-typer machines. His business during the last year of his life grew quite rapidly until he had several assistants at the time of his death this spring. He will be remembered as a pioneer in the use of typewritten copy for special uses in book publishing.

PRODUCTION NOTES

This Typewriter Type Issue of PRINT posed some real design, layout and make-up problems for our guest art director, George Shealy. Following our customary policy of demonstrating our subject in so far as possible, we asked George to have copy set by I. B. M., Varityper and Justowriter as well as to use ATF foundry typewriter type for some of the heads and Linotype between the acts for contrast and comparison.

As discussed in the text, there are certain particular problems in preparation of copy and layouts for typewritten copy for reproduction. The methods discussed and used here are not intended to replace conventional typesetting — they have special uses.

Great care must be exercised in preparing pinpoint perfect copy to avoid costly changes and corrections. Meticulous copy counting and scaling is necessary when planning to enlarge or reduce typed copy, to fit given areas or for headings, captions or footnotes. This is still a relatively new field lacking in skilled operators and sufficiently experienced typists. The designer must make use of glossy photostats in compilation of material for complete page layouts or spreads for offset reproduction. This involves the use of repros and unless great care is taken imperfections and variations in color and detail become accentuated.

Thanks are due to the manufacturers mentioned above for setting the bulk of the copy.

JUSTOWRITER *Galvin* is used in the sections on History, Limitations, Design and Manufacture. VARITYPER *Garamond Bold* is used for the sections on the Varityper and Designers. *Sans Serif* for the heads in these sections, *Elite* for the Title Page, Typewriter Detective and Introduction to the Showing and List of Faces.

I. B. M. *Bold Face No. 2* is used for the first time in the article by Mr. Jenkins.

ATF *Remington Pica* is used for most of the heads and cover type.

LINOTYPE *Caledonia* takes care of Special Uses, Special Machines and the List of Faces.

Varityping for some sections was done by the Philip Karben Company.

Linotype and Foundry type composition was by THE INTERNATIONAL PRESS who have also done the complete offset and letterpress printing of this issue under the direction of Mr. Jerome Weinstein. The last twelve pages are letterpress, balance inside and cover are offset.

Cover Paper is MOHAWK's *Superfine Cover.*

Text Papers are MEAD's *Moistrite Offset,* STRATHMORE's *Canary Strathmore Bond* and CANTINE's *Coated Book.*

Mailing Envelopes are United States Envelope's *Columbian Clasp.*

Inks were supplied by Sinclair & Valentine Co., Inc.

Binding (signatures Smyth sewed and covers glued on) by F. M. Charlton Co., Inc.

UP A TREE...

about how to turn out better looking letters...faster?

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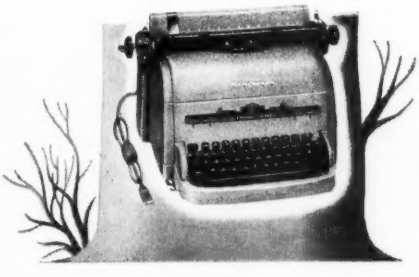

What's more, its amazing speed and ease of operation *increases typing production...decreases office typing costs...really boosts typists' morale.*

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A GOLDEN SPOON BOOK

CARLOS LOPEZ PRESS
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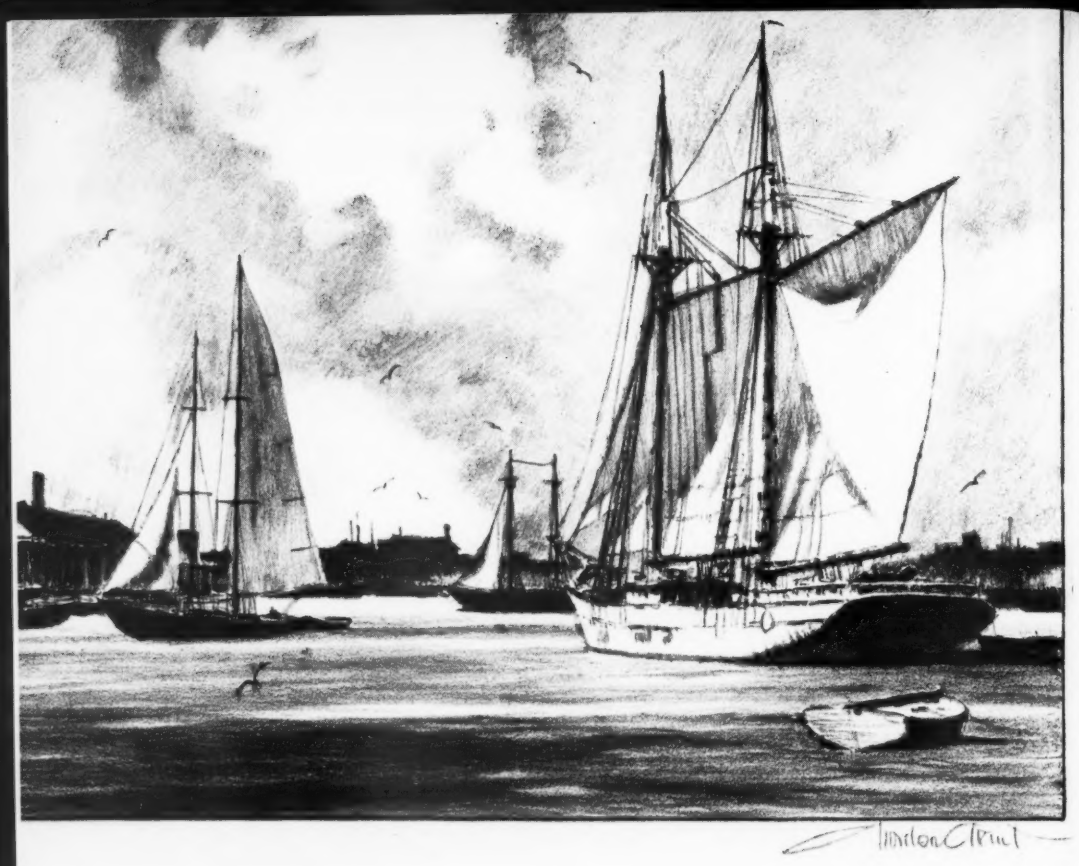
ENGRAVERS FOR THIS PUBLICATION
ARTISTS • PHOTO ENGRAVERS
Greenfield, Massachusetts



The Ant and the Butterfly is one of Gordon Grant's most pleasing lithographs. An elder statesman of the sea, he draws with authority the ships that pass upon its face and the men who work the ships. He is represented in the Metropolitan Museum of Art, and in other museums throught the country.

Mohawk Superfine Text, Cover and Bristol

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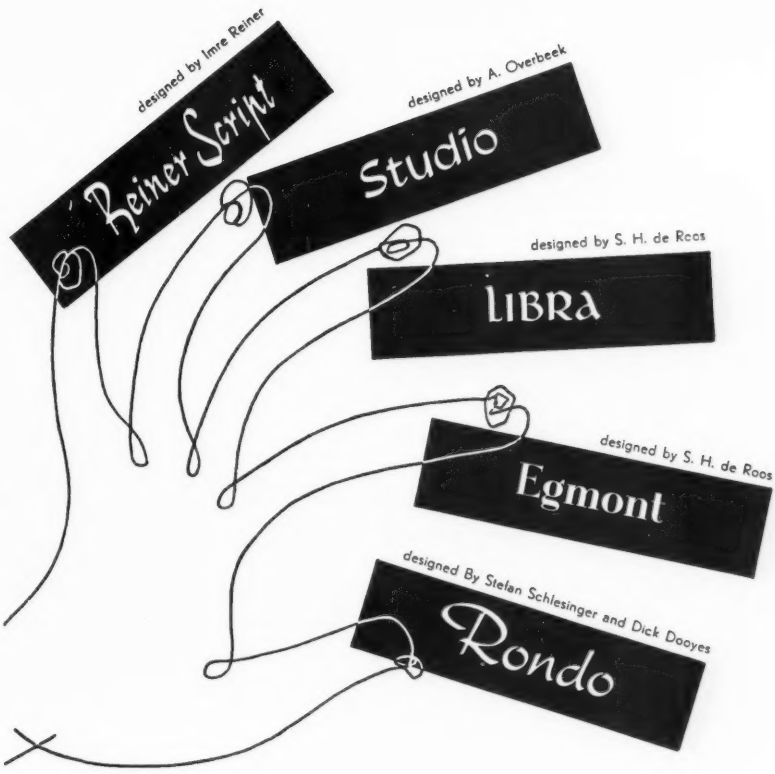
form a perfect background for the softness of offset lithography, the depth of gravure and the sharpness of letterpress. Made from high alpha fibres under rigid standards of quality, Mohawk Superfine is unmatched for appearance and performance. Mohawk Paper Mills, Cohoes, New York.



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